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COMMERCIAL SPACE LAUNCH ACT

HEARING

BEFORE THE

SUBCOMMITTEE ON
SCIENCE, TECHNOLOGY, AND SPACE

OF THE

COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

NINETY-EIGHTH CONGRESS

FIRST SESSION

ON

S. 2931

TO FACILITATE CERTAIN SPACE LAUNCHES, AND FOR OTHER PURPOSES

SEPTEMBER 6, 1984

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COMMERCIAL SPACE LAUNCH ACT

THURSDAY, SEPTEMBER 6, 1984

U.S. Senate,
Committee on Commerce, Science, and Transportation,
Subcommittee on Science, Technology, and Space,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:30 a.m., in room SR-253, Russell Senate Office Building, Hon. Slade Gorton (chairman of the subcommittee) presiding.

Staff members assigned to this hearing: Pete Perkins, professional staff member and Marty Kress, minority professional staff member.

OPENING STATEMENT BY SENATOR GORTON

Senator Gorton. Welcome to this hearing of the Subcommittee on Science, Technology, and Space.

Today we will consider several initiatives designed to develop the commercial potential of space through increased private sector investments and involvement. The primary focus of this hearing is S. 2931 which has been introduced by my committee colleague, Senator Trible. This legislation seeks to facilitate private sector space launch activity by establishing the Department of Transportation as the lead Federal agency with licensing authority over private expandable launch vehicle operations and by providing a framework within which this new industry can most effectively operate.

With the Federal Government's decision to phase out of expandable launch vehicle operations, an opportunity has been created for the private sector to enter into this segment of space activity. This committee agrees with the administration that it is appropriate to assist this infant industry by streamlining the process by which the Federal Government licenses commercial space launch operations, but the licensing of the first two commercial space launches in 1982 and again last month, demonstrated that the presently employed licensing process is unwieldy and burdensome. The committee hopes that the legislation before us will assist the Department of Transportation in its efforts to negotiate the maze of regulations that must be satisifed for a commercial space launch for launch applicants.

While the degree of success that this industry ultimately achieves will largely be a function of the marketplace, this committee believes that the Federal Government has a role to play in removing unnecessary institutional barriers, thereby creating a more favorable investment and operational climate. It is in this spirit that this legislation was introduced and in this spirit that this committee will act.

Today we will also discuss two other Federal Government initiatives to develop commercial space activity. On July 20, the President issued his national policy on the commercial use of space which identifies a number of ways to encourage and promote industrial research and manufacturing in space, and to develop space-based services. This policy, along with the space commercialization policy that NASA is developing will, I hope, establish a foundation on which the private sector will begin to develop products and services that cannot be developed efficiently on Earth. This committee's fiscal year 1985 NASA authorization supported both of these space commercialization initiatives, and so we have invited a representative of the administration to comment on both of them.

[The bill follows:]

98th CONGRESS
2d Session

S. 2931

To facilitate certain space launches, and for other purposes.

IN THE SENATE OF THE UNITED STATES

August 9 (legislative day, August 6), 1984

Mr. **Trible** (for himself, Mr. **Gorton**, Mr. **Heflin**, Mr. **Inouye**, Mr. **Riegle**, Mr. **Hollings**, Mr. **Kasten**, Mr. **Matsunaga**, Mr. **Stevens**, Mr. **Packwood**, Mr. **Ford**, and Mrs. **Kassebaum**) introduced the following bill; which was read twice and referred to the Committee on Commerce, Science, and Transportation

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A BILL

To facilitate certain space launches, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Commercial Space Launch Act".

FINDINGS

Sec. 2. The Congress finds and declares that—

(1) the peaceful uses of outer space continue to be of great value and to offer benefits to mankind;

(2) private applications of space technology have achieved a significant level of commercial and eco-

nomic activity, and offer the potential for growth in the future, particularly in the United States;

(3) new and innovative equipment and services are being sought, created, and offered by entrepreneurs in telecommunications, information services, and remote sensing technology;

(4) the private sector in the United States has the capability of developing and providing private satellite launching and associated services that would complement the launching and associated services now available from the United States Government;

(5) the development of launch vehicles and associated services on a commercial basis would enable the United States to retain its competitive position internationally, and contribute to the national interest and economic well-being of the United States;

(6) provision of launch services by the private sector is consistent with the national security and foreign policy interests of the United States and would be facilitated by stable, minimal, and appropriate regulatory guidelines that are fairly and expeditiously applied; and

(7) the United States should encourage private sector launches and associated services and, only to the extent necessary, regulate such launches and services

in order to ensure compliance with international obligations of the United States and to provide for the national security, foreign policy, and public health and safety interests of the United States.

PURPOSES

SEC. 3. The purposes of this Act are—

(1) to promote economic growth and entrepreneurial activity through utilization of the space environment for peaceful purposes;

(2) to encourage the United States private sector to provide launch vehicles and associated launch services by simplifying and expediting the issuance or transfer of launch licenses and by facilitating and encouraging the utilization of Government-developed space technology; and

(3) to designate an executive department to oversee and coordinate the conduct of launch operations, to issue and transfer launch licenses authorizing such activities, and to ensure that public health and safety, foreign policy, and national security interests of the United States are satisfied.

DEFINITIONS

SEC. 4. The purposes of this Act, the term—

(1) "agency" means an Executive agency as defined in section 105 of title 5, United States Code;

(2) "controlling interest", for purposes of paragraph 11(C) of this section, means a direct or indirect legal or beneficial interest in or influence over another person arising through ownership of capital stock, interlocking directorates or officers, contractual relations, or other similar means, which substantially affect the independent business behavior of such person;

(3) "launch" means to place or attempt to place, on a commercial basis, a launch vehicle and payload if any in a suborbital trajectory, in Earth orbit in outer space, or otherwise in outer space;

(4) "launch property" means tooling, propellants, launch vehicles and components thereof, and other physical items constructed for or used in the manufacture, launch preparation, or launch of a launch vehicle;

(5) "launch services" means those activities involved in the preparation of a payload for launch, the provision of a launch vehicle, and the conduct of a launch;

(6) "launch site" means the location on Earth from which a launch takes place, as defined in any license issued or transferred by the Secretary under section 7 of this Act, and includes all facilities located on a launch site which are necessary to conduct a launch;

(7) "launch vehicle" means any vehicle constructed for the purpose of placing a payload in outer space, and any suborbital rocket;

(8) "payload" means any object which a person undertakes to place in outer space by means of a launch vehicle, and includes subcomponents of the launch vehicle specifically designed or adapted for that object;

(9) "person" means any individual and any corporation, partnership, joint venture, association, or other entity organized or existing under the laws of any State or any nation;

(10) "Secretary" means the Secretary of Transportation;

(11) "State", and "United States" when used in a geographical sense, means the several States, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, the United States Virgin Islands, Guam, and any other commonwealth, territory, or possession of the United States; and

(12) "United States citizen" means—

(A) any individual who is a citizen of the United States;

(B) any corporation, partnership, joint venture, association, or other entity organized or existing under the laws of the United States or any State; or

(C) any corporation, partnership, joint venture, association, or other entity (whether organized or existing under the laws of a State or a foreign nation) which is doing business in the United States, if the controlling interest in such entity is held by individuals or entities described in subparagraph (A) or (B), and if (i) exercise of jurisdiction over such person is consistent with any international agreement in force for the United States at the time that the relevant launch is to take place or the relevant launch site is to be operated, and (ii) the launch or operation of a launch site would not occur in the territory of a foreign nation.

GENERAL RESPONSIBILITIES

SEC. 5. (a) The Secretary shall be responsible for carrying out this Act, and in doing so shall—

(1) encourage and facilitate launches by the private sector; and

(2) consult with other agencies to provide consistent application of licensing requirements under this Act and to ensure fair and equitable treatment for all license applicants.

(b) To the extent permitted by law and as circumstances require, Federal agencies shall assist the Secretary in carrying out the provisions of this Act.

REQUIREMENT OF LICENSE FOR PRIVATE SPACE LAUNCH OPERATIONS

SEC. 6. (a) No person shall launch a launch vehicle or operate a launch site within the United States, and no United States citizen shall launch a launch vehicle or operate a launch site outside the United States, unless such person or United States citizen is authorized to do so under a license issued or transferred under this Act.

(b) No United States citizens or other person who holds a license issued or transferred under this Act may launch a payload unless that payload complies with all requirements of Federal law. The Secretary shall ascertain whether such citizen or person has obtained any license or other permit which is required by any Federal law for launch of a payload. If any such license or permit has not been obtained, the Secretary may take such action under this Act as the Secretary considers necessary to prevent the launch of a payload by a holder of a license issued or transferred under this Act, until such citizen or person has obtained the license or permit. If no such license or permit is required by any Federal law, the Secretary may take such action under this Act as the Secretary considers necessary to prevent the launch of a payload by a holder of a license issued or transferred under this Act if the Secretary determines that the launch of such payload would jeopardize the public health and safety or the national security and foreign policy interests of the United States.

AUTHORITY TO ISSUE AND TRANSFER LICENSES

SEC. 7. (a) The Secretary may issue or transfer a license for launching one or more launch vehicles or for operating one or more launch sites, or both, to an applicant who meets the requirements of this Act and regulations issued by the Secretary under this Act. Any license issued or transferred under this section shall be in effect for such period of time as the Secretary may specify, in accordance with the provisions of section 12 of this Act.

(b) Notwithstanding any other provision of law, the authority of the Secretary to license or transfer a license for launches and matters related to such launches is exclusive, except for any license issued under the Communications Act of 1934 (47 U.S.C. 151 et seq.). No person shall be required to obtain any license, transfer, approval, waiver or exemption regarding the launch of a launch vehicle or the operation of a launch site, except as may be required pursuant to this Act.

LICENSING REQUIREMENTS

SEC. 8. (a) The Secretary shall by regulation prescribe requirements for the issuance or transfer of a license under section 7 of this Act.

(b) In prescribing requirements under subsection (a) of this section, the Secretary shall consult with appropriate agencies, in accordance with section 22 of this Act.

(c) The Secretary may, in any individual case, waive the application of any requirement prescribed under subsection (a) of this section with respect to a license if the Secretary determines that such waiver is in the public interest and will not jeopardize the public health and safety or the national security and foreign policy interests of the United States.

LICENSE APPLICATION AND APPROVAL

SEC. 9. (a) Any person may apply to the Secretary for issuance or transfer of a license under this Act, in such form and manner as the Secretary may prescribe. The Secretary shall establish procedures and timetables to expedite review of applications under this section and to reduce regulatory burdens for applicants.

(b) The Secretary shall issue or transfer a license to an applicant if the Secretary determines in writing that the applicant complies and will continue to comply with the requirements of this Act. The Secretary shall include in such license such conditions as may be necessary to ensure compliance with this Act, including an effective means of on-site verification that a launch or operation of a launch site conforms to representations made in the application for a license or transfer of a license. The Secretary shall make a determination on any application within one hundred and eighty days after receipt of such application. If the Secretary has not made a determination within one hundred and twenty days after receipt of such application, the Secretary shall inform the applicant of any pending issues and of actions required to resolve such issues.

(c) The Secretary, any officer or employee of the United States, or any individual or entity with which the Secretary has entered into a contract under section 13(b) of this Act may not disclose any data or information under this Act which qualifies for exemption under section 552(b)(4) of title 5, United States Code, or is designated as confidential by the person or agency furnishing such data or information, unless the Secretary determines that the withholding of such data or information is contrary to the public or national interest.

MODIFICATION, SUSPENSION AND REVOCATION OF LICENSES

SEC. 10. (a) Upon application by the licensee or upon the Secretary's own initiative, the Secretary may modify a license issued or transferred under this Act, if the Secretary finds that the modification will comply with the requirements of this Act and the regulations issued under this Act.

(b) The Secretary may suspend or revoke any license issued or transferred under this Act if the Secretary finds—

(1) that the licensee has substantially failed to comply with any provision of this Act, the license, or any regulation issued under this Act; or

(2) that the suspension or revocation is necessary to satisfy any foreign policy or national security concern of the United States.

Any such revocation or suspension shall become effective at such time as is specified by the Secretary.

(c) The Secretary may terminate, prohibit, or suspend immediately any launch or operation licensed by the Secretary under this Act if the Secretary finds that such launch or operation is detrimental to the public health and safety or if the Secretary finds that such launch or operation is detrimental to the national security or foreign policy interests of the United States. Any termination, prohibition or suspension issued by the Secretary under this subsection shall become effective immediately and shall continue in effect during any review of such order under section 11 of the Act.

(d) Whenever, the Secretary takes any action under this section, the Secretary shall notify the licensee in writing of the Secretary's finding and the action which the Secretary has taken or proposes to take regarding such finding.

ADMINISTRATIVE AND JUDICIAL REVIEW

SEC. 11. (a) An applicant for a licensee and a proposed transferee of a license under this Act shall be entitled to a determination on the record after an opportunity for a hearing in accordance with section 554 of title 5, United States Code, of—

(1) any decision of the Secretary under section 9(b) to issue or transfer a licensee with conditions or to deny the issuance or tranfer of a license; or

(2) any action of the Secretary under section 10 of this Act to modify, suspend or revoke a license, or to terminate, prohibit or suspend immediately any launch or operation licensed by the Secretary.

(b) Any final action by the Secretary under this Act to issue, transfer, deny the issuance or transfer of, suspend, revoke, or modify a license or to terminate, prohibit, or suspend immediately any launch or operation licensed by the Secretary shall be subject to judicial review as provided in chapter 7 of title 5, United States Code.

REGULATIONS

SEC. 12. The Secretary may issue such regulations, after notice and comment in accordance with section 553 of title 5, United States Code, as may be necessary to carry out this Act.

MONITORING OF ACTIVITIES OF LICENSEES

SEC. 13. (a) Each license issued or transferred under this Act shall require the licensee—

(1) to allow the Secretary to place Federal officers, employees or other designated individuals as observers at any launch site used by the licensee and at any production facility or assembly site used by a contractor of the licensee in the production or assembly of

a launch vehicle in order to monitor the activities of the licensee or contractor at such time and to such extent as the Secretary considers reasonable and necessary to determine compliance with the license or to carry out the reponsibilities of the Secretary under section 6(b) of this Act; and

(2) to cooperate with such observers in the performance of their activities.

(b) The Secretary may, to the extent provided in advance by appropriation Acts, enter into a contract with any individual of entity to carry out the functions of the Secretary under subsection (a)(1) of this section.

USE OF GOVERNMENT PROPERTY

Sec. 14. (a) The Secretary shall take such actions as may be necessary to facilitate and encourage the acquisition (by lease, sale, or otherwise) by the private sector of launch property or services of the United States which are excess or are otherwise not needed for public use.

(b) Notwithstanding any other provision of law, the Secretary shall establish and collect from any person a reimbursement for the lease, sale, or other use of excess launch property or launch services of the United States. The amount of any reimbursement, in the case of temporary use, shall be established in an amount equal to the direct costs incurred by the United States as a result of such use. The amount of any such proceeds in the case of sales shall be fair market value, as determined by the Secretary. The amount of any such reimbursement or proceeds of sale shall be deposited in the general fund of the Treasury, except that payments for utilities, property or services furnished by any agency to a buyer or lessee under this section shall be covered into the Treasury to the credit of the appropriation from which the cost of furnishing such utilities, property, or services was paid.

(c) The Secretary may establish requirements for liability insurance, hold harmless agreements, proof of financial responsibility, and such other assurances as may be needed to protect the United States, its agencies and personnel from liability or loss or injury as a result of launch activities involving Government facilities or personnel.

LIABILITY INSURANCE

SEC. 15. Each person who launches a launch vehicle or operates a launch site under a license issued or transferred under this Act shall have in effect liability insurance at least in such amount prescribed by the Secretary as is sufficient to satisfy international obligations of the United States. The Secretary shall prescribe such amount after consultation with the Attorney General and other appropriate agencies.

ENFORCEMENT AUTHORITY

SEC. 16. (a) The Secretary shall enforce the provisions of this Act. The Secretary may delegate the exercise of any enforcement authority under this Act to any officer or employee of the Department of Transportation or of any other agency, with the approval of the head of such agency.

(b) In carrying out this section, the Secretary may—

(1) make investigations and inquiries, and administer to or take from any person an oath, affirmation, or affidavit, concerning any matter relating to enforcement of this Act; and

(2) pursuant to any unlawful process—

(A) enter at any reasonable time any launch site, production facility or assembly site of a launch vehicle or a payload (in accordance with section 6(b) of this Act) for the purpose of conducting any inspection of, and may inspect, any object which is subject to the provisions of this Act and any records or reports required by the Secretary to be made or kept under this Act; and

(B) seize any such object, record, or report where there is probable cause that such object, record, or report was used, is being used, or is likely to be used in violation of this Act.

PROHIBITED ACTS

SEC. 17. It is unlawful for any person to violate any requirement of this Act, any regulation issued under this Act, or any term, condition, or restriction of a license issued or transferred by the Secretary under this Act.

CIVIL PENALTIES

SEC. 18. (a) Any person who is found by the Secretary, after notice and opportunity for a hearing on the record in accordance with section 554 of title 5, United States Code, to have committed any act prohibited by section 17 of this Act shall be liable to the United States for a civil penalty of not more than $100,000 for each violation. Each day of a continuing violation shall constitute a separate violation. The amount of such civil penalty shall be assessed by the Secretary by written notice. The Secretary may compromise, modify, or remit, with or without conditions, any civil penalty which may be or which has been imposed under this section.

(b) If any person fails to pay a civil penalty assessed against such person after the penalty has become final or if such person appeals an order of the Secretary and the appropriate court has entered final judgment in favor of the Secretary, the Attorney General shall recover the civil penalty assessed in any appropriate district court of the United States. In such an action, the validity, amount, and appropriateness of such penalty shall not be subject to review.

(c) For the purposes of conducting any hearing under this section, the Secretary may—

(1) administer oaths; and

(2) issue subpoenas for the attendance and testimony of witnesses and the production of relevant

papers, books, documents, and other records, and seek enforcement of such subpoenas in the appropriate district court of the United States.

RELATIONSHIP TO OTHER LAWS AND INTERNATIONAL OBLIGATIONS

SEC. 19. (a) No State may adopt or have in effect any law, rule, regulation, standard, or order which is inconsistent with the provisions of this Act. Nothing in this Act shall preclude a State from adopting or putting into effect any law, rule, regulation, standard, or order which is in addition to or more stringent than any requirement or regulation issued under this Act. The Secretary may, and is encouraged to, consult with the States to simplify and expedite the approval of space launch activities.

(b) A launch vehicle shall not, by reason of the launching of such vehicle, be considered an export for purposes of any law controlling exports.

(c) Nothing in this Act shall apply to—

(1) the launch or operation of a launch vehicle, the operation of a launch site, or any other space activity carried out by the United States or pursuant to any contract entered into by the United States; or

(2) any planning or policies relating to any such launch, operation or activity.

(d) The Secretary shall carry out the responsibilities of this Act consistent with any obligation assumed by the

United States in any treaty, convention or agreement that may be in force between the United States and any foreign country, and shall consider any applicable laws and requirements of any foreign country.

REPORT

SEC. 20. Not later than one year after the date of enactment of this Act, the Secretary shall submit to Congress a report describing all activities undertaken pursuant to this Act, including a description of the process regarding the application for and approval of licenses under this Act. As part of such report, the Secretary shall include recommendations for additional legislation that may further launch activities. Such report shall also identify Federal statutes, treaties, regulations, and policies which may have an adverse effect on launch operations, and include recommendations on appropriate changes to such statutes, treaties, regulations and policies.

SEVERABILITY

SEC. 21. If any provision of this Act, or the application of such provision to any person or circumstance, is held invalid, the remainder of this Act and the application of such provision to any other person or circumstance shall not be affected by such invalidation.

CONSULTATION

SEC. 22. (a) The Secretary shall consult with the Secretary of Defense on all matters under this Act affecting national security. The Secretary of Defense shall be responsible for identifying and notifying the Secretary of those national security concerns of the United States which are relevant to activities under this Act.

(b) The Secretary shall consult with the Secretary of State on all international matters arising under this Act. The Secretary of State shall be responsible for identifying and notifying the Secretary of those foreign policy obligations and commitments of the United States which are relevant to activities under this Act.

(c) The Secretary shall consult with other agencies, as appropriate, in order to carry out the provisions of this Act.

AUTHORIZATION OF APPROPRIATIONS

SEC. 23. For purposes of carrying out this Act, there are authorized to be appropriated to the Secretary $4,000,000 for fiscal year 1985 and such sums as may be necessary for fiscal years 1986, 1987, 1988, and 1989.

EFFECTIVE DATE

SEC. 24. (a) Except as provided in subsection (b) of this section, this Act shall take effect one hundred and eighty days after the date of enactment of this Act.

(b) Regulations to implement this Act shall be promulgated no later than one hundred and eighty days after the date of enactment of this Act.

Senator **Gorton**. On behalf of the subcommittee, I welcome our guests here today. We look forward to their testimony and responses as we consider several new enterprising avenues of commercial space activity.

And now I will turn this over to my colleage, Senator Trible, for an opening statement to speak to his bill.

OPENING STATEMENT BY SENATOR TRIBLE

Senator **Trible**. Thank you, Mr. Chairman. I want to thank you for scheduling in a very prompt fashion hearings on the Commercial Space Launch Act, and I want to thank you again for your unfailing courtesy and cooperation and encouragement, my friend.

Also I want to, in his absence, express my special thanks to Senator Heflin, the ranking member of the subcommittee, for lending his expertise and support to this effort.

Last year marked the 25th year of the American Space Program, and as we embark on the second quarter century, I believe that 1984 will be seen as the most significant year for space since we reached the Moon.

In his state of the Union address earlier this year, President Reagan unveiled a bold proposal for a manned space station which, in conjunction with the shuttle will reap great benefits for our Nation.

The space shuttle continues its remarkable success and NASA continues to work well with American industry to harness the great commercial potential of space.

On February 24 of this year, the President took an important step in ensuring the viability of the commercial expandable launch vehicle industry when he issued an Executive order directing the Department of Transportation to facilitate and coordinate the activities of this promising infant industry. The bill we consider today builds on that foundation.

In addition, the chairman of this subcommittee, Senator Gorton, will soon introduce legislation to eliminate tax inequities encountered by the commercial space industries. I am pleased to cosponsor that measure which corrects the unintended consequences of tax laws enacted when space-based industries were nothing more than dreams.

And finally, the President will soon announce his appointments to the new Commission on Space which will help to identify our goals in space for the rest of the century and beyond.

This is indeed an exciting time of great activity in space policy, and I am pleased by the nonpartisan atmosphere surrounding this measure and other space initiatives. Only by working together can we do what is best for our Nation and provide economic opportunities through space commercialization.

In fact, the central purpose of this legislation, as the chairman well knows, is to facilitate and encourage the growth of the commercial space launch capability which complement NASA's reusable space shuttle.

The current governmental approval process for space launch operations is a regulatory maze, involving as many 18 Federal agencies and 22 different statutes. This bill replaces that maze with an approach that we euphemistically call one-stop shopping. The applicant simply goes to the Transportation Department, which is responsible for determining whether the application satisfies applicable statutes.

This new regulatory framework will promote private launch activities, promote public health and safety, and meet foreign policy and national security requirements. DOT will be required to defer to the Department of State in matters affecting foreign policy, and the Department of Defense in matters affecting national security.

Our Nation no longer holds a monopoly in the space launch business. By encouraging a commercial ELV capability, this legislation will enhance our international competitiveness in the space launch marketplace and promote economic growth for this Nation. This fledgling industry can provide jobs and other benefits for our people as we approach the 21st century.

Exploiting the vast economic potential of space requires that the Government be a partner, not an obstacle. The Commercial Space Launch Act is an important step, opening the final frontier of space to private enterprise.

So I thank you for these hearings, Mr. Chairman. I welcome the testimony of our witnesses today, and I look forward to working with you and the other members of this subcommittee, marking up a bill, and taking it to the floor of the Senate very quickly.

Senator GORTON. Thank you, Senator Trible.

Senator Heflin has an opening statement and will have written questions for the record.

[The statement follows:]

OPENING STATEMENT BY SENATOR HEFLIN

Mr. Chairman, the Subcommittee on Science, Technology, and Space will receive testimony today on S. 2931, the Commercial Space Launch Act. This legislation, combined with the land remote sensing legislation that the Committee considered earlier this year, represents another step in the Era of Space Commercialization.

Mr. Chairman, twenty-five years ago this Nation was taking its first steps into civilian space. Today, we are considering legislation that will license private firms to launch payloads into space. We've come a long way!

Mr. Chairman, as an original cosponsor of S. 2931, I am most supportive of this legislation and am pleased to discover that the Administration now supports this bill. I do have three reservations with S. 2931:

1. Section 7(b) concerning the extent of the Secretary's authority;
2. Section 15 concerning liability insurance and the extent of the coverage required; and
3. Section 22 and the need for the Secretaries of Defense and State to have the ability to notify the Secretary, at any point in the process, to preclude an activity because of national security or foreign policy interests.

It is my understanding that language is currently being negotiated between the State Department, the Department of Transportation and the Committee staff to remedy problems 2 and 3, and that the staff has agreed that section 7(b) must be reworked to make it clear that the authority granted the Secretary does not abrogate or supersede existing laws or regulations.

Mr. Chairman, I look forward to today's testimony and hope that we will be able to consider expeditiously S. 2931 and to have a bill on the President's desk before we recess in October.

Senator GORTON. Our first witness today will be the Director of the Office of Commercial Space Transportation of the U.S. Department of Transportation, Jennifer Dorn.

STATEMENT OF JENNIFER DORN, DIRECTOR, OFFICE OF COMMERCIAL SPACE TRANSPORTATION, DEPARTMENT OF TRANSPORTATION

Ms. DORN. Good morning, Mr. Chairman, Senator Trible. It is a distinct pleasure for me to be here today, particularly when the administration enthusiastically shares the goals of your committee in encouraging the development of private sector in space.

The President's decision to encourage expendable launch vehicles and their commercialization is based on his strong belief that a continuing need exists for proven launch systems that have performed so well over the past 25 years. Truly, expendable launch vehicles are a national asset, and it is in the best interests of the country, the economy, and preserving international competitiveness that we promote their commercialization.

Senator Trible, your leadership and the committee's support will enhance DOT's ability to establish a licensing procedure that is fair and expeditious and truly serves to meet our goals.

As I mentioned, the administration wholeheartedly supports the general purpose of S. 2931. We do recommend a number of minor amendments which I would be happy to discuss with you later.

As you know, the Department of Transportation has been the lead agency designated under the Executive order for the past 6 months, and our responsibility, as both Senators indicated, was to encourage, facilitate, and coordinate activities related to commercialization of ELV's. Certainly, in our view, the Executive order has conveyed the necessary authority for DOT to assume a leadership role, as it has done in the past 6 months, within the executive branch.

The basic authority for approving launches, for licensing private sector operations, continues to be the authority contained in the international traffic and arms regulations, which has been delegated by the President to the Department of State. And, as you know, this provides for the oversight of the international munitions trade. The application of these particular regulations, however, has required a somewhat expansive interpretation of the law and has resulted in the designation of launch vehicles or payloads as exports. We believe that it is more appropriate that a specific operation be licensed under specific authority granted to DOT, rather than relying on authority that belongs to another department and which designates a launch vehicle as an export. It is our view, that this expansive interpretation of ITAR could create problems down the road.

Thus, we are eager that in this legislation, you replace the ITAR process. We believe that S. 2931 effectively does that, and the administration is pleased to support the bill with the modifications as indicated.

I believe it would be useful to briefly describe some of the activities that we have engaged in at the Department of Transportation over the past few months, to better indicate the diversity of the emerging industry, as well as the diversity of their interests, and the complexity of some of the problems.

It is never without complication that a process and a program that has relied exclusively on the Government is transferred to the private sector, and we are facing some of those problems, I think. Along with the cooperation—which has been extensive—of a number of other agencies and their enthusiasm, we have been able to minimize those complexities, but I think it's a reality we need to face. Thus, we are pleased that Congress is joining the administration in its efforts to encourage the commercial use of expendable launch vehicles.

I think it has been very important, that the Secretary of Transportation created an office that reports directly to her. On a number of occasions in our work, since the President designated the Department of Transportation as the lead agency, the Secretary of Transportation has consulted with a number of other Cabinet agencies on problems or potential problems. Her personal attention has encouraged a quick remedy or perhaps a much quicker remedy than having to rely on a more complicated line-oriented decision process. And I think that is very important. It indicates this administration's commitment to expediting the process and giving the industry and the investment community a predictability, certainty, and confidence that the administration and Congress are really serious.

The actual prototype launch activity in which we have been involved, which was the test and demonstration launch for a company called Starstruck, allowed the Government to have, for the first time, a hands on experience with the approval process. This has enabled us, even though it was a suborbital launch off international waters, to eliminate some overlapping information and review requirements. We found that there was really an excess of caution on the part of a number of Federal agencies. They were not sure that there was any one agency in charge, and therefore they wanted to make sure that legitimate public policy concerns had been met.

Now that there is a focal point, I think there is a sense of confidence that a single agency has the responsibility to make sure all public policy needs are met, and that has, as a result, eased the burdens for the industry. We are not home free yet, but I think many of the informational requirements have been minimized.

We have found that our ability to serve as an honest broker is enhanced by our single issue focus. The Office of Commercial Space Transportation is concerned exclusively about promoting and regulating expendable launch vehicles, so therefore there is an advocate in a single agency. That helps drive other agencies who have numerous other responsibilities to a quicker resolution.

We have also been able to see, through that prototype launch, how the process really works. It has allowed us to compile information requirements so that each industry will know the kinds of information that the Government needs. We are in the process now of informally coordinating that information. We will publish that list in the Federal Register, which should be a great help, I believe, to the industry.

Those kinds of activities in which we are promulgating regulations in no way impedes us from helping industry right now on a case-by-case basis, and I would like to make that very clear. We are trying a two-track approach which we think is appropriate: Developing the long-term regulatory process on the one hand that is responsive and responsible; and, as the need arises and as industry comes to us, we are able to streamline and help shepherd their application through the licensing process.

We have also worked very closely with the Department of Defense in order to encourage the use of national ranges. Secretary Weinberger, as you know, a few months ago agreed to a policy that assesses only direct costs to private users of national ranges. We the Department of Transportation are working with Defense to help implement that policy, so that if a private sector user wishes to use the national range or the facilities thereon, the procedures can be expedited and the costs will be minimal, the same kinds of costs that we would levy against a Government user.

Now, for those who seek to operate vehicles from commercial sites, we are developing criteria for site selection and operating procedures. We have also been active, and I believe successful, in efforts relating to radio frequency assignments and insurance requirements. As you know, we are subject to the provisions of the Liability Convention and the Outer Space Treaty, with respect to third-party liability if an accident should occur on foreign soil or outside of the United States.

We have also been active in the economic area, attempting to increase the competitiveness of domestic ELV's in the world marketplace. We have been working with a number of Federal agencies, the U.S. Trade Representative's Office, Commerce Department, NASA, State Department, in order to encourage that a fair competitive atmosphere in which the industry can grow and thrive.

To conclude, I would just like to say that our approach at the Department of Transportation and our clear objective is to be responsive to the industry and responsible to the American public. The Secretary recognizes that if the industry is to grow and develop, it needs elbow room. And that is precisely what we are attempting to give the industry. That is why on a daily basis—and I do mean on a daily basis—our staff is in contact with representatives of industry to assess their needs and how we can better meet those needs

We aim to be both responsive and responsible at the same time, assuring that public safety, foreign policy, and national security needs are met, as Senator Trible indicated.

We have found a very cooperative atmosphere, I must say, amongst the Federal agencies, and we are very pleased about that. I think there is a genuine excitement on the part of the American public that we have transportation systems to space that are not only operated by the Government, but that are operated by the private sector, and that soon, this means of transportation will be just another mode whose activities fall within the preview of DOT.

Our responsibility is clearly to create a climate that is conducive to private investment in space and that increases America's competitive edge. We believe that domestic expendable launch vehicles can complement the world's most sophisticated transportation system, the shuttle, and we are eager to work together with Congress to achieve what we believe not only to be an important goal, but an imperative one.

I would be pleased to answer any questions you might have.

Senator GORTON. Thank you very much.

S. 2931 directs the Secretary of the Department of Transportation to make a determination on a launch license application within 180 days after the application is received. Is this a reasonable period of time, or do you think a shorter period of time would be appropriate and achievable?

Ms. DORN. Mr. Chairman, we believe that 180 days is certainly the maximum amount of time that would be required. And it may only be required for as yet unproven or newly developed launch vehicles from an as yet unregulated site.

In other words, if we have an Atlas vehicle or a Delta vehicle that plans to use a Government range, the time period required could well be far less than 180 days. If we have a test and demonstration vehicle that is now being developed to be launched from international waters or from some other site, it may require 180 days. Our commitment, however, is to conduct our review as expeditiously as possible.

Senator GORTON. Could you share your thoughts with us on the role that the Secretary of Defense and the Secretary of State should have respectively in national security and in foreign policy considerations with respect to licenses?

Ms. DORN. Certainly. In every license application, there is a process that can be called mission approval. We need to know what kind of payload, if any, is being launched, and where, and how, and by what means. This information needs to be closely coordinated with Department of State which has responsibility for protecting the foreign policy interests of the United States, and with Department of Defense. We have already made provisions for that coordination in the developing the regulatory process and in reviewing the application to conduct a prototype launch which we just approved.

We believe that a consultative process is appropriate, and if there are any other further matters to be resolved, they can be resolved at an appropriate level. We do not anticipate that this will present a problem.

If the State Department raises an issue which they believe to have foreign policy implications, truly it is our role to take that matter very seriously. Conscious of our role in encouraging the private sector development of expendable launch vehicles, we are comfortable with the approach that has been designated in Senator Trible's bill.

Senator GORTON. The subcommittee is aware of the current executive action to transfer the ITAR process to the Department of Transportation relative to commercial space launches.

Has your office identified other regulations that may not be appropriate or applicable to commercial space launches, but are presently being extended to cover them?

Ms. DORN. No, Mr. Chairman. In our review to date of the various agencies which have authority, we have discovered that it is not necessarily their specific authority which is inappropriate; it is the lack of process which tends to mire down the license approval.

We believe that, with DOT as an honest broker and as an advocate at the helm as lead agency, can expedite appropriate reveiw processes carried out by other agencies.

Our role is to make sure that those kinds of reviews occur expeditiously. So, to date, we have not discovered other regulatory authority, like the ITAR, that we believe require specific statutory attention.

Senator GORTON. What is DOT's policy with regard to generic licenses? That is to say, two, three, four consecutive launches using the same class of vehicle?

Ms. DORN. I think, perhaps, I could best answer that by first giving a philosophical approach, and then perhaps by showing a chart.

First of all, the Department of Transportation has a commitment to make simple, direct, expeditious approvals. A generic launch license, however, in the strictest sense, is really not a possibility. For every kind of launch, we need to know the purpose of the launch, the payload, its destination, and its implications for the Nation's national security or foreign policy objectives.

However, in effect, if a launch vehicle is proposed that will use the precise technology used in previously approved launches, it will be a pro forma kind of application review.

If I could just take 1 minute to show the chart here, it might give you a better idea of our licensing approach. There is a two-pronged test applied in granting a license. The first, as is indicated in the chart, is a proof of capability to conduct a safe launch. In other words, a vehicle manufacturer, an operator, comes to us and says we have this precise type of vehicle, flight termination system, range safety capabilities, et cetera. We are able, then, as test (a) to give a proof of capbility statement to that company. Some people have called that a launch approval.

Now, the second test is the mission approval. That is the part which indicates what type of payload will be on the vehicle, where it goes, and other types of indications of the flight plan, that enable us to assess potential impacts on national security and foreign policy interests, et cetera.

Once those two tests have been met, a license may be given. That does not, however, allow the individual to launch at will at some future time without meeting particular conditions and standards set out in the license approval.

Perhaps it would be best to explain this process in comparison to air carrier certificates. A license is given for air carriers based on a proof of capability. But if particular standards on a day-to-day basis are not met, whether it be weather conditions or the fact that insurance capabilities have not been met, that air carrier does not fly.

We think this is a good approach for the expendable launch vehicle industry. If you have a vehicle that has not yet found a payload, as an example, we could, once they have proved their technical capability to conduct a safe launch, issue a letter or other assurance that could be used to assure potential customers that DOT has approved their proof of capability, and that part of the license test has been met.

In other instances, in a case where different payload is launched using a previously approved vehicle, the proof of capability would be a pro forma kind review, because we would have already approved their vehicle and operating procedures. Our objective is to make this as simple as possible while protecting the public.

Generic launch licenses, because no two launches are the same, would really be impossible. However, we do not think this would be a burden to the industry.

That was an extremely long answer to a very short question, and I apologize.

Senator GORTON. What role do you think your office should have in the launch of a U.S. ELV from a foreign country? Have you had any contacts with the governments of other nations relative to this issue?

Ms. DORN. It is our clear reading of the legislation as you have proposed, that a U.S. industry launching from foreign soil would be subject to the licensing requirements of the act.

Senator GORTON. Do you have any current policy on that subject?

Ms. DORN. That would be our current policy as well.

Meeting with representatives of other countries at this time would be premature in the absence of an application or a specific request. We have to deal in real time here, and once such a request was made of course, we would meet with representatives of other countries and discuss this issue.

Senator GORTON. One issue under consideration by the subcommittee is the amount of liability insurance a launch vehicle operator should be required to carry. Do you have a policy or a philosophy or a recommendation on that issue?

Ms. DORN. Yes, we do, Mr. Chairman. As you know, as a result of the Liability Convention and the Outer Space Treaty, there must be a specified minimum level of insurance, and we of course agreed to this standard, with the United States named as beneficiary. That level of insurance will be determined in consultation with the Attorney General, which is the standard practice.

Our approach would be, as we are now attempting to work out within the administration, that the United States would reserve the right to bring action against responsible parties for any excess liability over the insured amount. We believe this protects the industry and protects the government.

We would seek to set the level of insurance based on the amount of insurance commercially available, the assessed risk, or a combination of both approaches. We have not yet determined what the most appropriate approach would be.

Senator GORTON. As you know, there are two Federal mechanisms for certifying commercial launch payloads now: the FCC for communcation satellites, and the Department of Commerce for remote sensing satellites.

What role, if any, do you see for your office in the commercial launch of a payload for which there is no Federal certification process now?

Ms. DORN. We at the Department of Transportation are not in a position, in our view, to license payloads as the Commerce Department, say, licenses remote sensing satellites. However, it is our understanding and our clear reading, that the bill conveys sufficient authority to prevent a launch if we discover that the payload does not comply with the national security, public safety, or foreign policy interests of the United States.

Conceivably, there could be a concern that up until the last minute before the launch of these uncertified payloads, the operator may not know whether or not the launch will be approved. I don't think that this will present a real problem. Our constant interaction with the industry will ensure that it is well informed as to the process and any information that might still be required to resolve particular problems. Mission approvals can be expedited, then, by early notification as to the payload that they plan to use on the launch vehicle.

An example may be that a private company knows that they are going to launch payload X, and that mission approval could well be granted 2 years in advance of that launch, depending on the specific terms and conditions cited in the license. We don't think that that is a real problem, and we do believe there is clear authority in the bill to protect the public so that we could deny a launch or not permit a launch in the event that the payload did not meet government requirements.

Senator GORTON. Finally, could you tell us what progress you have made in formally establishing requirements or regulations relative to the issuance or transfer of a launch license? How do you plan clearly to establish those conditions which an applicant must meet?

Ms. DORN. We have a number of policies, manuals, and regulations now in the works, some of which have to do with the information requirements for approving a test and demonstration launch. Smaller entrepreneurial firms would, we think, be more concerned about that. Their approach may require a totally new kind of process, in contrast to the already proven launch vehicles which have used Government ranges for 25 years.

In addition, we have several procedural documents which we are working on that will explain how industry will gain access to national ranges. We are talking about simplified users manuals and that type of thing.

In addition, we are developing procedures for launch licenses, whether they be on commerical or on national ranges, and included in that are criteria for designation of commercial ranges. As you know, we do not have standards at this point.

Senator GORTON. Thank you.

Senator Trible.

Senator TRIBLE. Thank you, Mr. Chairman.

Director Dorn, first let me thank you for your very positive testimony today, and let me applaud your leadership in the administration for the commercialization of space. You have been a positive advocate of an important enterprise.

Let me ask you just two brief questions if I might. The DOT mission under this bill is to regulate the emerging ELV industry. DOT also plays a very positive role as an advocate, encouraging and facilitating the development of private sector ELV capability.

Are these two roles, in your view, compatible? Can an advocate also be a responsible regulator?

Ms. DORN. We believe that our acceptance of these two roles do not present a problem and, to date, we have not found it to be so. I think there are other agencies in the Federal Government that have those dual responsibilities. If or when we found this to be a problem, I think we would move to remedy that situation.

Senator TRIBLE. You indicated in your testimony or alluded to problems down the road if this bill is not enacted and ELV's continue to be classified as exports.

Can you share with us, either today or for the record, some of the problems that you might envision?

Ms. DORN. There may, Mr. Chairman, be some problems with respect to taxation and the policies that currently exist with respect to exports. I would like to provide the specifics for the record. I am only indicating those as potential problems. We feel that under the Executive order, the transfer of the ITAR process to the Department of Transportation is a workable solution. It may not be the best one, but it certainly will cause no burdens for the industry.

We feel, however, that a permanent statutory fix, if you will, is a far preferable approach.

Senator TRIBLE. On that note, I will end my questions and I thank you for being here today.

Senator GORTON. There will be written questions to you from Senator Heflin as well.

With that, I thank you as well.

Ms. DORN. Thank you, Mr. Chairman.

[The statement follows:]

STATEMENT OF JENNIFER L. DORN, DIRECTOR, OFFICE OF COMMERCIAL SPACE TRANSPORTATION, DEPARTMENT OF TRANSPORTATION

Mr. Chairman and members of the subcommittee: on behalf of the Secretary of Transportation, I would like to thank you for your support of the commercial launch services industry.

Senator Trible's leadership and the committee's support will enhance DOT's ability to establish a licensing scheme to assist the private sector in expanding the potential for growth in the commercial applications of space technology that have been developed over the past twenty-five years.

This administration views facilitation of the commercial development of expendable launch vehicles (ELVs) as an important component of America's Space Transportation Program. We expect that a healthy viable ELV industry, as a complement to the Government's Space Transportation System, will produce a stronger, more efficient launch capability for the United States that will contribute to continued American leadership in space.

On July 4, 1982, President Reagan made it clear that he wanted private enterprise to have a stake in developing the frontiers of space when he called for "an aggressive, far-sighted space program" that includes private sector investment.

The President re-emphasized that commitment in his State of the Union Address in January when he observed that the market for space transportation could exceed the Federal Government's capacity to provide it. He made it clear that his policies would recognize the need of private companies interested in launching payloads to have ready access to space.

In issuing Executive order 12465, the President designated the Department of Transportation as lead agency to carry out this mandate. I would like to describe for you the activities of the Office of Commercial Space Transportaton since its creation six months ago, as well as comment on the legislation Senator Trible has introduced.

ACCOMPLISHMENTS UNDER THE EXECUTIVE ORDER

The Office of Commercial Space Transportation—established by Secretary Dole in response to the executive order—has quickly become the focal point for government and industry contact regarding the President's initiative to promote and regulate the commercial use of ELVs. The Office has been actively involved in implementing the Department's charter to encourage, facilitate, and coordinate activities related to commercialization of ELVs. We have established working relationships with each of those Government agencies that has major interests in space transportation and licensing. Our job is facilitated by the high level of interest and involvement in the administration's commercialization efforts among senior officials in the Federal Government.

Members of the Cabinet, particularly Secretary of Defense Weinberger, Secretary of Commerce Baldrige, and Administrator Beggs of NASA, have been quick to mobilize their agencies in support of commercialization policies. Similarly, the career staffs of our sister agencies have displayed a high level of enthusiasm and a results-oriented attitude. NASA, the Departments of State, Defense, Commerce, and Justice, as well as the U.S. Trade Representative's office, have been very cooperative and helpful in providing support to implement the President's initiative.

Because both the Government and the private sector have had little experience with commercial ELV launch operations and their regulation, we took as our first task the systematic investigation of the legal and operational issues that could affect commercial ELVs. This has been a major task.

Prior to November 1983, the many Federal Government agencies with space responsibilities were very cautious with regard to approving commercial ELV operations. The Departments of State and Defense, NASA and FAA were justifiably concerned that regulatory responsibility be exercised with adequate oversight and that every aspect of Government interest be preserved. Our first task as lead agency within the executive branch has been to establish certainty and confidence among the agencies that the Government is serious about commercialization and that the Office of Commercial Space Transportation will provide a coherent and comprehensive view to regulating, coordinating, and overseeing this distinctive, if not unique, activity.

REGULATORY ACTIVITIES

Our primary goal, or course, is to establish an efficient regulatory framework that addresses public safety needs as well as foreign policy and national security safeguards, and that provides predictability for the industry without stifling it. We have found that the problem is not that too many agencies are involved in regulating this industry, but rather that there were almost no Government processes designed to address the wide range of issues and unique needs of private sector ELV launches. The Office of Commercial Space Transportation's actions are aimed at striking a balance in the regulatory environment between an appropriate level of flexibility for an emerging industry and the certainty and predictability that are essential to the success of any private venture. In this effort, there is no shortage of unanswered questions or complicated issues.

Since OCST's establishment, our efforts have covered actual prototype launch activities; radio frequency assignments; transfer of launch licensing authority; the regulation of commercial and Government ranges, including safety and range use requirements; insurance requirements and a number of other areas. In our first week as lead agency, we discovered that Starstruck, seeking a license to launch a test and demonstration rocket, was caught in the regulatory log jam.

Our first "hands on" experience was to facilitate the Federal approval process for Starstruck's test launch that was successfully ocnducted off the coast of California on August 3. To achieve this, we assisted the efforts of the approving agencies—State, NSAS, FAA, Materials Transportation Bureau (MTB) and U.S. Coast Guard—to set priorities, to coordinate their activities and thus to expedite the Federal review. No sooner had the final Federal approval been issued than Starstruck faced difficulties with local authorities. Through the Coast Guard and MTB, we were able to alleviate concerns of local safety officials. And later, when Starstruck's concept of launching 250 miles off the coast proved infeasible, we worked with the compnay, the FAA, Coast Guard and the Department of Defense to develop ways to allow Starstruck to launch in closer proximity to the United States' coast. This experience has been invaluable in shaping our ideas, actions, and recommendations for streamlining the Federal approval process, as I will describe later.

The next task was to examine the Government's central launch licensing process itself; i.e., the requirement for an export license under the International Traffic in Arms Regulations (ITAR). Short of statutory licensing authority, the ITAR were the only basis for Government control of all launches. DOT believed it important to transfer the ITAR to an organizational setting where, consistent with the focus of commercial ELV activity, thus allowing it to be effectively administered as a launch license instead of an export control.

As a result of these efforts, DOT and the Department of State have already agreed, as an interim measure, to the transfer of authority from State to DOT for launch approvals of commercial launch vehicles and payloads through the ITAR process. Authority will be shifted through an amendment ot Executive Order 11958.

The Government's "hands on" experience guided our development of a streamlined licensing procedure. We have already identified three techniques which could (and did, in the case of Starstruck,) substantially simplify and shorten the Federal approval process: reduction or elimination of sequential coordination; elimination of duplicative review through voluntary reliance of one agency on another agency's work, wherever possible; and specification in advance by each agency of its information requirements. The last issue is one which has been particularly frustrating for new companies. We are in the process of circulating among our sister agencies a draft list of launch license information requirments to be published in the Federal Register in the near future. Although the Data will be informative, not regulatory, in nature, each launch company will have a single document which describes, in layperson's terms, the authority of each regulatory agency and the information the company will be expected to provide.

In the near term, most commercial launch activity will occur from the Government's (national) ranges. Firms such as General Dynamics and Transpace Carriers, Inc. have vehicles that are dependent on the launch facility and resource support at Vandenberg Air Force Base or Cape Canaveral. Although NASA and the Air Force are eager to support commercial activities, their rules, regulations, and procedures are designed to accommodate government and not commercial operations.

Over the past few months, we have worked very closely with Air Force personnel to review existing policies, procedures, and processes that affect the cost and commercial use of national ranges. Together, we have made significant progress in minimizing and eliminating barriers to commercial operations. In particular, the Federal Government is opening these facilities to the established launch vehicles, but this also is bringing in first-time users as well, setting major precedents for other firms that may emerge in the years to come. As a general matter, the Air Force and NASA have been responsive to our efforts under the executive order to introduce new ideas or raise the priority of issues being reviewed and expedite the decision process. We work together with the commercial ELV firms to assist them in making important contacts on the national ranges and resolving issues as they arise with regard to commercial use of Government facilities and services.

In the world of regulation, however, Government priorities become a reflection of private sector activity. Although we encourage the use of Government launch facilities, commercial firms are giving active consideration to establishing commercial ranges. In contrast to Government ranges, where we satisfy public safety needs by managing the range and the vehicles on it, we will achieve this end on commercial ranges by regulating the design of ranges and their operational requirements.

Although range regulations will be based on accepted launch and range safety concepts, we must adapt these approaches to recognize the differences between Government and private sector roles. We are now developing the concepts and criteria for launch site selection, range design, range and vehicle safety, flight safety corridors, flight termination systems, to name a new. To achieve this, we have been meeting with the Government's range safety leaders, as well as the companies' launch operations officials, and of course drawing on resources of the Air Force as well as NASA.

Not all of our issues are as comprehensive in scope, but their impact may be equally significant. For example, the launch firms were concerned that their access to Government controlled radio frequencies critical to launch activities might be constrained. DOT brought together representatives of five ELV launch firms, the Federal Communications Commission, and the National Telecommunications and Information Administration to discuss the industry's radio frequency needs and potential problems. From the standpoint of both the Government and industry, the discussions proved extremely helpful. Small firms learned that their short term frequency needs could be satisfactorily resolved by using experimental radio bands while large firms learned that their needs would be satisfied through the range scheduling process. Solutions to long term frequency needs are now under study within the NATA, FCC and the Office of Commercial Space Transportation.

OCST's experience in the new arena of private space transportation has taught us that attempts to reduce regulation to a single, all-encompassing procedure designed to meet all potential situations are untenable. It would be impossible to foresee all the possible impediments confronting a single launch in a highly complex, dynamic industry. Furthermore, we find it is most effective at this point to resolve problems simply by case-by-case intervention as launch preparations unfold.

As necessary, we expect to convene the interagency group established by the executive order to bring to bear the agencies' accumulated regulatory expertise on particularly complex questions where discussion in that forum is appropriate. Of course, each affected agency is most conversant with its own statutory responsibilities and their application to private sector ELV space launches. Our regular discussions with each have enabled us to identify solutions to regulatory problems. It is imperative that we continue the process, with the aid of the responsible agencies, of culling out what is truly unneeded, inappropriate, or duplicative.

POLICY INITIATIVES

The OCST has participated in various policy making forums, both as a member of the Senior Interagency Group on Space, chaired by the National Security Council, and the Cabinet Council on Commerce and Trade. Its role has been to contribute to the establishment of a space strategy, which the President signed, and to evaluate initiatives that promote and encourage private sector participation in commercial space endeavors, approved by the President on July 17, 1984.

In addition, we have worked successfully with other executive agencies to establish a pricing policy for the commercial use of national range facilities and services. The direct cost pricing policy that has been adopted by the Department of Defense implements the intent of the national security decision directive to promote the use of national ranges and sets charges for such use at a level comparable to that assessed Government users.

We are working with the Departments of State and Commerce, the U.S. Trade Representative, and NASA to develop policies to increase the competitiveness of U.S. commercial ELVs in the world market. In recent years, a number of governments and firms in other countries have focused on developing their own launch capabilities. International organizations such as Intelsat, the International Telecommunications Satellite Organization, and Inmarsat, the International Maritime Satellite Organization, have demonstrated a tendency to spread procurement among member countries. This has resulted in perference for the Ariane, for example, as a means to diversify sources of supply. In addition, foreign subsidies have increased U.S. industry's use of foreign ELVs. If the United States is to maintain its leadership in space, it must afford the private sector an opportunity to compete on a fair and reasonable market-oriented basis with Ariane and other foreign ELVs in order to advance our overall competitiveness in this area.

We participated with the Commerce Department in preparing policy papers for spring 1984 meetings of the Organization for Economic Cooperation and Development (OECD). In these efforts, our objective was to establish an efficient and equitable international trading system in space products and services so that U.S. and foreign governments and firms, as well as international organizations, are able to use commercial U.S. or foreign ELVs on a reasonably competitive basis. If U.S. private industry can compete on reasonable terms, we believe that it can be successful.

DOT is also participating in the investigation and consultations with regard to an alleged violation of section 301 of the 1974 Trade Act being conducted by the U.S. Trade Representative. The initial complaint of unfair pricing practices was brought forward by Transpace Carriers, Inc., a new entrepreneurial launch firm seeking fair and reasonable competitive market conditions. After obtaining advice from an interagency group, the U.S. Trade Representative will make recommendations to the President by July 1985 on what action, if any, to take.

PROMOTIONAL ACTIVITIES

We are also taking advantage of other, more specific opportunities to promote the use of domestic commercial ELVs.

The Secretary has made speeches and appearances before major private sector and Government-sponsored groups—both space and non-space related—to discuss the President's initiative and our commitment to providing the private sector with ready access to commercial space transportation opportunities.

An important aspect of encouraging the development of any new industry, particularly one which has been identified exclusively with Government, is public visibility awareness. In addition, the Secretary has established an Industry Advisory Committee that will institutionalize the flow of information between the private sector and the Federal Government on issues of concern to both. A structure for continuing, focused dialogue with the entire industry provides an important opportunity to discover and surmount barriers to ELV commercialization. This committee will also serve and the "early warning system" to identify and analyze regulatory and other hurdles, recommending actions that would eliminate or minimize them.

The committee will include representatives of major aerospace manufacturers, large and small launch companies, satellite manufacturers, communications companies, investment firms, the space law community, insurance brokers and underwriters, the reaserch and academic communities, and other experts in the space field. We plan to convene the first meeting of this committee in October.

DOT COMMENTS ON S. 2931

One of the first tasks of the Department of Transportation in assuming its role as lead agency, was the identification of the various sources of authority and mechanisms available within the Federal Government for implementing the President's directive. While the executive order conveyed the necessary authority for DOT to assume a leadership role within the executive branch in this endeavor, the basic authority for approving launches by private commercial firms continues to be the President's ITAR authority, as delegated to the Department of State, which provides for the oversight of international munitions trade. Application of these regulations, however, required an expansive interpretation of the law and its implementing regulations, resulting in the designation of a launch vehicle or payload as an export.

The administration supports the general purpose of S. 2931 to establish a Federal licensing scheme for ELVs. In the Department's view, S. 2931 provides the Secretary of Transportation with appropriate licensing authority for replacing the ITAR process with a flexible approach to establishing a regulatory framework to deal with this emerging industry. We do strongly urge, however, that a number of technical amendments be made to the bill.

1. Page 6—Add "Or other international law" between "States" and "at" on line 12.
2. Page 10—Add "Beyond the Government or any State government with jurisdiction under section 19(a) of this act," between "disclose" and "any" on line 9.
3. Page 13—Delete § 14(a) in its entirety. In § 14(b), delete the words "establish and" on line 20.
4. Page 14—delete "As determined by the Secretary" on line 1. In addition, renumber § 14(c) to become § 15(a). The existing language of § 15 becomes § 15(b) and lines 17-19 are revised to read, ". . . liability insurance in such amounts as considered necessary by the Secretary in light of the international and other obligations of the United States."
5. Page 16—on line 10, insert "Prior to referral to the attorney general," before "The Secretary may. . . ."

As a final matter, the administration suggests two additional amendments. On page 18, we would suggest that the committee delete lines 10-17 beginning with, "as part of such reporting policies." Additionally, section 23 of the Senate bill authorizes $4,000,000 for purposes of carrying out this act in fiscal year 1985. The Department believes that current departmental funding levels are adequate to implement this legislation. We therefore feel that additional authorizations are unwarranted at this time.

The committee correctly anticipates that systematic oversight of the payload issue will be needed. The United States is absolutely liable under international treaty for any damage suffered by nationals of other countries from any launch in which we qualify as the launching State. We will, however, require those who participate in the programs to have the necessary insurance to protect the United States.

We believe that the general approach reflected in the legislation introduced by Senator Trible can aid in achieving the objectives set by both the executive and legislative branches. By incorporating these changes, the bill will fulfill its intent to establish an efficient licensing scheme and will not provide authorities or budgetary authorizations beyond what are needed to fully implement the licensing procedures.

In closing, I would like to thank the committee for including commercial ELV space transportation on its agenda. The executive branch is working aggressively to create conditions that permit the commerical ELV industry to provide the United States with a private sector alternative for placing payloads in space. For many missions not requiring manned capability, cost-effective, dedicated, and reliable ELVs are an attractive alternative. Their capability can be invaluable for users who need to place specialized payloads in space when the particular orbit, launch window, or space on the shuttle's manifest may be unavailable.

We strongly urge the subcommittee to adopt the amendments we have proposed and look forward to continuing to work with you on ELV commercialization in the future.

This completes my prepared statement, and I would be pleased to respond to your questions.

Senator **GORTON**. We will now hear from a panel consisting of the Assistant Associate Adminstrator for Customer Relations and

Policy of NASA, Mr. Gillam; and the Assistant to the Associate Deputy Administrator for Commercialization of NASA, Mr. Evans.

STATEMENT OF ISAAC T. GILLAM IV, ASSISTANT ASSOCIATE ADMINISTRATOR FOR CUSTOMER RELATIONS AND POLICY, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, ACCOMPANIED BY L.J. EVANS, JR., ASSISTANT TO THE ASSOCIATE DEPUTY ADMINISTRATOR FOR COMMERCIALIZATION

Mr. GILLAM. Good morning, Mr. Chairman, Senator Trible. I appreciate the opportunity to testify before you on S. 2931, the Commercial Space Launch Act.

NASA has and will continue to strongly support the President's initiative on the commercial use of space, and indeed is the focal point for many of the Nation's commercial use of space activities. Through our program of joint endeavors with U.S. industry and our technical support to space entrepreneurs, the commercial upper stage manufacturers used with the shuttles, such as the PAM's, the DTS's, and the fledgling ELV industry, we are providing the opportunity for the development of space business which should help to ensure continuance of this country's leadership.

We support the designation of the Department of Transportation as lead agency for regulating the commercial expendable launch vehicle activities, and support the regulatory aspects of the proposed legislation. However, we defer to DOT with respect to the desirability of possible amendments to the bill. While NASA is not in the business of regulating any industry, we have, throughout our history, had an active program for making our technology readily available to American industry and have played a major role in the privatization of expendable launch vehicles.

Briefly this morning, I would like to discuss with you some of the actions that NASA has taken to support the privatization of ELV's, our plans to phase out the use of ELV's, and our relationship with the Department of Transportation.

In early February 1982, representatives from Space Services, Inc. [SSI] met with the Administrator of NASA to discuss SSI planning for a private commercial launch service. This meeting occurred after the unfortunate experience by SSI with their own design of a liquid engine, and, as a result, had concluded that their future would be more successful using solid motors.

In the meeting, SSI discussed their plans for a suborbital demonstration flight from Matagorda Island, TX. This flight focused on use of the proven orbital capability of a Minuteman-derived solid stage vehicle and qualifying Matagorda Island as a launch site. SSI further requested that NASA provide, on a reasonable reimbursable basis, two solid motors of the Minuteman second stage class for use in this flight.

The Administrator expressed an interest in the SSI project, concluding that it was of sufficient national interest that NASA cooperate in the SSI endeavor within the terms of the Space Act. Accordingly, a working group was established in NASA to work with SSI. At that time SSI, very much a pioneer in space commercialization, began working with NASA, FAA, and the State Department relative to their proposed launch since DOT had not yet been granted authority in this field.

Later that year in April, State asked NASA's technical advice on a munitions case; that is, SSI requesting export approval for the launch. NASA reviewed the case and responded to State, providing comments which State relayed to SSI. State also suggested that SSI work directly with NASA in resolving some of these comments/considerations, and the working group described earlier began interchanges with SSI, State, and FAA. FAA had also been petitioned by SSI for allowance to launch.

In the interim, NASA was progressing on a method whereby the motors requested by SSI could be released to them. Confirmation on motor availability and legality of their release to SSI was underway. The motors were deemed available and satisfactory for flight, and a method was determined for their release. SSI would reimburse NASA for the motors and their processing to flight status as well as shipment to the launch site. An agreement was signed by both parties—NASA and SSI—to this effect, and a motor was delivered to Matagorda Island from where it was successfully launched. A second motor was held by NASA as backup should SSI require it. With the successful flight, it was not needed. SSI reimbursed NASA for its effort.

In summary, the relationship between SSI and NASA, although plowing much new ground, was a successful one for both parties with mutual benefits from their participation. As one of the SSI staff put it, "Without NASA's help, we would not have had the launch." This relationship is being continued as SSI explores privatization of Scout.

NASA is proceeding to phase out its current expendable launch vehicle's systems in accordance with the President's policy that states that the shuttle is a primary space launch vehicle for U.S. Government missions. No new production of any expendable launch vehicle is contemplated by NASA, as reflected in our fiscal year 1985 budget request. No appropriated funds are being requested by NASA for continuation of these vehicle systems. In the meantime, we are continuing to respond to our current user needs in fulfilling the existing commitments to launch ELV's on a reimbursable basis.

NASA activity with the Scout launch vehicle is essentially complete, NASA is operating the system for DOD on a reimbursable basis. Launches will be conducted for DOD through 1987 at which time DOD or a commercial operator will assume responsibility for the program.

Production will soon be completed on the Delta with the potential for five missions remaining—the last of which is in 1986. Our current plans call for transfer to a commercial operator, Transpace Carriers Inc., as soon as possible or after the last Government launch in 1986.

Production of the Atlas-Centaur will be completed by the end of 1984 for the last Government launch in 1987. At this time, or before if General Dynamics Corp. is ready, responsibility for Atlas Centaur will be transferred to them.

In summary, Government missions are not being assigned to ELV's, and NASA is currently in the posture of running out the string of its previously committed launches. All ELV production will be stopped by the end of 1984, with all Government launches completed by the end of 1987.

I would like to touch briefly on the general provisions of agreements that NASA has with commercial operators that are proposing to take over the operation of these ELV's, and then review the status of each of these agreements. These agreements include the following provisions:

Upon selection by NASA, the operator has exclusive rights to market and produce the launch vehicles that were previously operated by NASA.

Initiation of commercial production must be accomplished by this commercial operator without any Government funding or without any Government liability.

The operator would assume the responsibility to launch their commercial vehicle after the Government completes its customer commitments in general. However, we have an agreement that calls for a deviation from this deviation. The operator could assume some Government launches if the customer agrees and NASA is satisfied that there are no additional reliability risks, and that is the case of the exception that I was talking about.

The operator will negotiate and make arrangements with vehicle contractors, DOD, DOT, and NASA centers for production, facilities, equipment, and support services.

NASA will make available hardware, tooling, test equipment for manufacturing, and checkout of the vehicles on a reimbursible basis.

A preliminary agreement for marketing the Delta launch vehicle was signed by NASA and Transpace Carriers, Inc., in April 1984, and then forwarded to the Congress. Both House and Senate responses accepted the agreement, commending NASA's approach. The agreement was approved by the NASA Administrator in May of this year.

The agreement authorized TCI to establish a commercial Delta program and to conduct sales and marketing for Delta launches. Although TCI is actively marketing Delta with potential users, they have not, to our knowledge, to date signed any missions. In order to facilitate their commercial endeavor, NASA has agreed to provide backup launch assurance to their potential customers, as long as they plan to launch before we, NASA, dissipate our launch capability in 1986. They are working with NASA in identifying property and equipment lists needed to manufacture the Delta vehicles and negotiating subagreements with DOD for range support and with the Kennedy Space Center for launch support services. They have obtained proposals from the major systems contractors, including McDonnell Douglas, and are negotiating these proposals with an intent of beginning vehicle production in October 1984.

General Dynamics, in their planning, would take over the Atlas Centaur operations in 1987. Accordingly, the negotiations with them are not as far along as those with TCI. We are in the final stages of negotiating only two remaining issues. GDC has indicated that they are considering the privatization of the Atlas vehicle along with the Atlas Centaur combination. We are working with

General Dynamics to include this option. Signature of the agreement is anticipated within the next several months.

Since the selection authorized GDC to market Atlas Centaur, GDC, too, has been actively marketing the system. They have offered funding to one potential user of Atlas Centaur—Rainbow—and they have initiated preliminary negotiations with DOD for range services and KSC for launch site support.

NASA has recently received a query from Space Services, Inc., of America on the privatization of the Scout vehicle and the use of Government launch facilities at Wallops Island and Vandenberg Air Force Base, as well as Conestoga launch vehicles. The planning calls for privatization of Scout through the completion of the program, and subsequently providing a purely commercial family of Conestoga launch vehicles as a follow-on system to Scout.

It is NASA's intent to give up Scout management in 1987 either to the DOD—for whom NASA is now operating Scout, or to a commercial operator. We have coordinated this position with the DOD, and DOD has responded that there would be no objection to privatization as long as DOD/NASA requirements are met.

NASA issued a Commerce Business Daily [CBD] announcement in August requesting expressions of interest by commercial operators of the Scout system. The procedure we plan for Scout will follow the precedents set by the Delta and Atlas Centaur experience. We will issue a solicitation package encompassing and defining the Scout Program to interested CBD responders. We will then evaluate the responses to the solicitation package and select a single operator on criteria similar to that used in the Delta and Atlas Centaur negotiations. After selection, we will then negotiate a final agreement for operation of Scout. DOD coordination will be requested for these activities.

The use of the CBD announcement provides an open forum for competition on Scout operation as it did previously on the Delta and Centaur. If only one response—SSI—is received, we would begin discussions with them on the solicitation package as a preliminary to negotiations.

It may be useful to the committee to discuss our working relationship that has been established with the Department of Transportation. After issuance of the Executive order making DOT the focal point for the regulation and promotion of commercial ELV activities, our ELV office established contact with them and provided several presentations on existing vehicles, status of commercialization activity which NASA had begun, and offered technical and consulting services.

In this regard, DOT was advised of the signature of our preliminary agreement with TCI and joined with NASA in a concurrent press release on this activity. They have used our facility at Wallops Island for range operations and consultations, and are using information gained from them on a continuing basis to formulate a policy for range operations for a commercial operator.

As roles become more defined within the DOT, we anticipate that these initial examples of cooperation and coordination will grow. We will continue to ensure that the technical expertise that we have accumulated after 25 years in the space launch business will be available not only to those in the private sector, but will be available to the DOT and other Government agencies.

I appreciate the opportunity to appear before you this morning, and defer to Mr. Bud Evans who has a statement, and then we will both be prepared for questions.

[The following information was subsequently received for the record:]

QUESTIONS OF SENATOR GORTON AND THE ANSWERS THERETO

Question. One issue that this Committee is studying relative to this legislation is the licensing of U.S. commercial launches conducted in foreign countries. What are the considerations that should be examined relative to any need for such a license?

Answer. A commercial U.S. ELV launch operator planning to conduct launch from a launch site in a foreign country presumably would require some sort of approval/authorization/licensing from the Government of the host country where the launch site is located.

Under the terms of the 1967 Outer Space Treaty, Article VI, the Government of the United States is responsible for the activities of U.S.-origin, non-Governmental entities in outer space and for providing authorization and continuing supervision to those entities to ensure compliance with the terms of the Treaty.

This interpretation has been adopted by the Department of State in several export licensing actions carried out by the Office of Munitions Control. Two of those cases involved launches of U.S. communications satellites on the Ariane. State Department required that the U.S. spacecraft owner indemnify the U.S. Government (over and above the responsibility and liability assumed for the Ariane launch vehicle by the Governmentof France) for claims which might be made against the U.S. under the terms of the 1967 Treaty and the 1973 Liability Convention by injured third parties; this was translated into insurance premiums of $300,000 per launch. The other cases with which I am familiar involved launches of private, suborbital launch vehicles, one from Texas and the other from international waters off the coast of California. In both these cases, State Department took a stance comparable to that for the two communications satellites.

These are not strictly analogous to "commercial launches conducted in foreign countries." but they do indicate that in the above cases State Department is taking a broad interpretation of the obligations of Article VI of the 1967 Outer Space Treaty. Since the launch operator must provide third party liability, then the United States would seem to retain licensing responsibility even when that launch operator worked in another country. Precedents described above make this applicable to operation on U.S. territory, in international waters, and (for spacecraft) to foreign territory on foreign launch vehicles.

In addition, there remains the requirement for ITAR licensing for a U.S. launch operator seeking to launch from territory outside the U.S.

Question. Do you consider it necessary now or do you anticipate a future need to license upper state systems as part of the Department of Transportation's licensing authority over commercial space launches?

Answer. Commercial upper stages are being developed for payloads to be launched in the Space Shuttle in the future. These will be treated as integral elements of the payload for purpose of integration with the Shuttle and preparation for launch and as such will be subject to all NASA policies and procedures vis-a-vis safety and acceptability for launch. Therefore, there will be no reason to require any additional licensing by the Department of Transportation which is limited to commercial activity outside the NASA purview.

QUESTIONS OF SENATOR TRIBLE AND THE ANSWERS THERETO

Question. You mention Wallops Island, Virginia as one of the sites where the privatized Scout ELV might be launched. Can you predict the extent of economic activity which might occur on Wallops if the Scout becomes a popular commercial ELV? What would be the economic benefits to Wallops if this occurs? Where else are Scout ELV's launched now?

Answer. It is difficult to predict the extent of economic activity which might occur if the Scout launch vehicle becomes a popular vommercial ELV. Wallops has not been heavily utilized as a site for Scout launches. The last launch of Scout from Wallops, for example, was in 1979 and only a small maintenance capability exists there now. However, two Scout launches are planned for 1985 with a commensurate increase in support.

Any use of Wallops by a commercial operator would require support by a launch team. Some new positions and support activity would be required at the site, the number and estimated dollar value of this related economic activity would depend upon the commercial operator's success.

Scout launches are currently conducted at the Western Space and Missile Center in Califormia, the San Marco Range in Kenya, Africa and at Wallops Station in Virginia.

Question. You mention that NASA intends to transfer the Delta ELV to TCI, Atlas/Centaur to General Dynamics, and is negotiating with SSI for the Scout ELV.

Does this mean that these companies would assume responsibilities for marketing these ELV's to other potential operators, in addition to conducting their own launches? Is NASA taking steps to ensure that this "Off-the-shelf" ELV technology will be available for purchase to new companies at a fair price? Are such steps necessary or can we assume that TCI, SSI, and General Dynamics have every reason to maximize the market for ELV's? Could a new company purchase an ELV from another source than these three companies?

Answer. It could well mean that these companies could market these ELV's to other potential operators in addition to conducting their own launches. However, such action could be interpreted as competition by the approved operator, and would only occur if mutually satisfactory arrangements were concluded between the operators.

We have taken steps to ensure "off-the-shelf" ELV technology is available for purchase by new companies at a fair price. In our negotiations with TCI, for example, we have discussed making the production type hardware and use of facilities available to another operator under a mutually satisfactory arrangement, i.e., between the two commercial operators.

We believe that the general interest of the program would be best served by greater participation by more than one user of a particular piece of hardware or tooling; in this way, both could reduce their operating costs. However, we took the precaution to discuss it so that the NASA position is well recognized.

A new company could purchase an ELV from another source other than these three companies. Starstruck and SSI both exercised this approach in their demonstration launches.

Questions of Senator Heflin and the Answers Thereto

Question. Based on your market analysis and your negotiations with TCI, General Dynamics, and SSI, what opportunities exist for commercial space launch firms? Will it be necessary to provide government payloads to get these industries on their feet?

Answer. Transpace Carriers, Inc. (TCI), General Dynamics Convair (GDC), and Space Services Incorporated (SSI)—the commercial operators who have proposed privatization of NASA Expendable Launch Vehicles (ELV's)—have indicated in their discussions/negotiations with us that they are exploring opportunities in two areas: (a) new commercial communication satellite missions that are designed to be compatible with either Shuttle, Ariane, and one or more U.S. ELV's, with the intention of selection of their launch based solely on price; (b) new commercial missions in new areas of activity whose technical requirements are unique, have restrictive launch window or orbit inclinations, or express special handling restrictions or characteristics that prohibit inclusion in a multiple payload environment. They have not shared with us identification of specific missions they envision being in these categories. Such information is considered proprietary in nature.

We do not believe it would be proper to consider the question of deliberately providing Government payload launch requirements to a commercial ELV operator solely for the purpose of "sustaining him until he reaches operational profitability." In effect, this would amount to subsidization and be in conflict with the national policy that the Shuttle is the primary launcher for Government missions.

Question. You indicate that as of today, TCI has yet to sign any missions. Pursuant to your agreement, TCI must sign 3 launches by October of this year to maintain the rights to the Delta.

Will NASA grant TCI an extension to meet this provision of the agreement? What activities are being taken by NASA or any other Government agencies to secure payloads for TCI?

Answer. Transpace Carriers, Inc. (TCI) has formally requested that their Interim Agreement with NASA be extended 60 days beyond its current end date of October 1, 1984, to allow them time to complete current activity in raising additional financing, negotiating contracts for start of vehicle production, and marketing potential customers. We have acceded to that request and have amended the agreement to extend it to December 1, 1984.

Consistent with Government policy, NASA has not assisted TCI directly in securing customers; however, NASA has formally committed to guarantee backup launch capability to two prospective TCI customers—SBS and AUSSAT.

Question. An issue of central concern to S. 2931 is how to insure the fact that any proposed payload is not a threat to public health and safety, national security of foreign policy concerns.

Could you give us an idea of how NASA has addressed these concerns in the past? What activities are currently under way between NASA and DOT to insure the fact that the latter agency has a comparable capacity?

Answer. Over the past (25) years a complete set of policies evolved and procedures concerning safety and health were established by NASA and the USAF in conducting launch operations at national ranges. These procedures are documented in extensive, detailed manuals that require completion of all launch preparation activities in strict adherence to the procedures specified and careful verification and certification by responsible government personnel. NASA has briefed DOT officials on this subject and they have indicated that they will adhere to this or a similar process in their activities and that any streamlining of regulations they accomplish will not compromise this area. Our ELV office is currently reviewing a proposed policy entitled "Informational Requirements for Test and Demonstration Launches" by commercial activities for DOT.

NASA advises DOD and DOS of our launch activities including overflights of foreign countries, time of launches, etc., in advance of the event. From our experience with DOT, we have reason to believe they are coordinating with DOD on national security and DOS on foreign policy concerns in much the same manner. Both TCI and GDC have personnel who are intimately familiar with this process.

Question. A conscious decision was made by NASA and the Administration to phase out NASA's current expendable launch vehicle systems. This decision was premised on the belief that the Space Shuttle would be the primary space launch vehicle for Government missions.

Did this decision make any assumption as to whether or not a commercial ELV capacity would be developed? If such a commercial ELV industry were to fail, would NASA be requested to reassess its decision to terminate expendable launch vehicle systems?

Answer. The phase out of NASA ELV programs is still in progress and is timed to be consistent with the Shuttle having achieved operational status and having adequate capacity to satisfy launch requirements. It has been recognized that ELV capability that might be available in the future could be looked upon by government satellite programs as a backup capability, available to them should they miss their launch opportunity on Shuttle for any reason during a period of transition to the Shuttle. However, NASA has planned that the fully operational Shuttle would have sufficient capacity to accommodate all government payloads and not depend in any way on availability of a commercial ELV capability. Thus, failure of privatization of ELV's will not alter NASA activities in phasing out its ELV programs, nor be cause for reassessment of its decision.

Mr. Evans. Thank you, Mr. Chairman. Rather than read my statement, I will just submit it for the record.

Senator Gorton. It will be included in the record, in full.

Mr. Evans. Thank you.

I thought I would spend just a few minutes talking about some of the major points that were in that statement. First of all, I am going to try to deal with an area that is somewhat different than the expendable launch vehicle area. I am going to try to deal with what we call commercial space endeavors. And basically what we are looking at here are new high technology ventures that create new wealth, new technology, and new economic activity.

We distinguish commercial space endeavors from what Mr. Gillam called "privatization," which is moving a Government program from the Government sector to the private sector. Both can be good, but if you do not make that distinction, I think that we miss some of the different kinds of things that have to be done to support each of the two kinds of activities.

On the commercial side, I would like to deal with what the opportunities are, and we think there is vast potential; second of all, what some of the pitfalls are. There is no Utopia in this, there is no panacea; it is going to take a while to make it happen. Third, what the international competitive picture looks like, and finally what some of the highlights of the President's policy on commercial space are.

In terms of the commercial opportunities, I think probably what is most exciting to those of us at NASA, and I think for those in the American public, are what we can do to help people with medical problems. We have the opportunity to make new drugs that you cannot make, at least in large quantities, on Earth. This gives us the potential of curing diseases that are as significant as diabetes. The recent flight which just returned safely yesterday was a demonstration of moving in that direction. McDonnell Douglas and Johnson & Johnson with their electrophoresis system, and Charlie Walker, who was the first private person to go into space, produced a drug hormone that will be tested by the Federal Food and Drug Administration over the coming months, and we hope before too long will be available to the public.

Another area that has medical implications is where we have produced the first commercial product from space on the shuttle flight before this one. It is called monodispersed latex microspheres. That is a long name for something that can be very helpful in being able to do medical research on glaucoma, determining the size of cells and pores in the eyes, as well as being able to do cancer research in intestinal areas.

We have given a contract to, or a recent agreement with the National Bureau of Standards to distribute that to medical institutions across the country, so I believe that the commercial arena in space and using the unique properties of space holds tremendous potential for benefitting our people, bringing space back to Earth to benefit people here on Earth.

However, there are some commitments that need to be made if we are to achieve those opportunities. If we look at the McDonnell Douglas/Johnson & Johnson program, they have been at it for 7 years. It will probably take another 3 years before it is widely available. It is about a 10-year process. If we start now, we can have similar kinds of things occur over the next 10 years if we make a commitment of resources, and if we create a partnership between what Jim Webb liked to call the "three pillars of knowledge of our country—the Government, industry, and academia—" and we will propose that we do that with what we call "centers of excellence." If we make that commitment over the next decade, I believe we can realize these commercial opportunties.

Now, if you turn to the international side, that commitment to encourage the commercial use of space is being made. If you read a recent article in Aviation Week, you would have seen that the Japanese have targeted commercial space ventures as one area that they are going to go after. They have a number of trading companies and consortiums of companies in Japan that are now focusing their efforts on commercial space ventures, and as Aviation Week reported, they have been over here looking at some of our high technology companies that are concentrating in commercial space.

I think that the opportunities and the international competitive issues are two of the drivers that led to the President's policy on commercial space. There were four main thrusts to that policy. The first dealt with economic incentives, and I think it is probably worth making sure that we all understand that there was a philosophy that went into the economic incentives that are proposed by the President. And that philosophy is that we were going to eliminate discrimination against space-based business that have occured because space-based businesses were not in existence when the tax laws were written. There is no subsidy, there is no special interest tax provision that is proposed in the President's policy, and I think it is important for us to keep it in mind. All we are trying to do is give space businesses an equal footing.

The second area of the President's policy dealt with legal and regulatory incentives. There were two major thrusts to those. One was to get more timely decisions to industry, and I think that the work of this committee is to be applauded in terms of helping with that as regards to expendable launch vehicles. There are other areas that need work, such as radio frequency assignments.

Also, we tried to look at the area of equity. If a company makes an investment of hundreds of millions of dollars, then certainly its proprietary information ought to be assured of being protected. So, we would propose that there may be a need for some change in terms of legislation that assures that that information will be protected.

The third area is research and development. NASA has made a commitment based on the President's policy to both quantitatively and qualitatively change the way that it does its basic research that is related to commercial ventures. On the qualitative side, we will give much more emphasis to allowing industry and encouraging industry to help us set the research agenda of those areas that are likely to have applications potential, thereby helping us win international markets. And I think most of us would agree that the United States has always been very good at developing the basic technology and getting in the forefront. Sometimes we have not been as competitive in getting that technology to market, and we think this will help us compete with those that have been very good in that area.

Finally, establishing a national policy that industry can feel some assurance will last. That is one of the reasons the President established the Cabinet Council Working Group on Commercial Space, and we look forward to using that vehicle as a way for assuring that the Nation focuses on those issues that are of key importance to this new growth industry.

With that, I will just submit my statement for the record.

[The statement follows:]

STATEMENT OF L.J. "BUD" EVANS, JR., ASSISTANT TO ASSOCIATE DEPUTY ADMINISTRATOR FOR COMMERCIALIZATION, NASA

Mr. Chairman and Members of the Subcommittee: I welcome this opportunity to review with you the recently announced National Policy on the Commercial Use of Space and some of the NASA initatives which will support the Administration's commercial use of space policy.

As we enter the commercial space age, the broad spectrum of opportunities for private industry to use space technology to stimulate new commercial space ventures has sparked the interest of a variety of U.S. businesses. Businesses dervied from the commercial uses of space can help to promote economic growth, provide jobs for our people, and improve our nation's competitiveness in international markets.

This Committee is to be commended for its support of these new commercial space ventures by holding this hearing on Senator Trible's "Commercial Space Launch Act", and for supporting an amendment to the NASA Space Act of 1958 directing NASA, "to seek and encourage, to the maximum extent possible, the fullest commercial use of space."

Commercial space ventures include the development of new products, processes, and services which can be applied to the marketplace. Listed below are some general categories of commercial space ventures that will contribute to the vast potential the commercial use of space holds, and will provide the focus of my testimony:

1. New advanced technology commercial space ventures
2. New commercial space applications of existing technology
3. Commercial operations resulting from the transfer of existing space programs and services to the private sector.

You just heard testimony on NASA's views on a portion of the third category of commercial space ventures: the privatization of expendable launch vehicles. Unlike privatization, which involves the transfer of government developed technology and assets to the private sector and where much of the risk already has been absorbed by the government, the commercial use of space involves new high technology ventures. Over the coming decades, these commercial space ventures will result in the creation of new technologies and economic growth. The capabilities of the operational space shuttle and permanent manned space station, both of which provide a new kind of laboratory for research and development in the zero gravity of space, will be the enabling technologies for these high risk commercial space ventures.

Because of the unique, high-risk aspects of doing business in space, both aerospace and non-aerospace companies have been somewhat reluctant to invest capital in these high technology ventures. Some of the deterrents to such investments include: industry's lack of familiarity with potential opportunities for commercial space products, the high front-end costs and long-term payback outlook associated with doing business in space, and, until recently, the lack of a demonstrated policy commitment by the U.S. government to expanding private sector investment in space.

Reducing these technical, financial, and institutional barriers to the commercial use of space requires the development of a dynamic partnership between the three pillars of strength in our nation: industry, academia, and government. This partnership, in combination with a steady commitment of reasonable resources, drive, and imagination, will result in the preeminence of our nation in commercial space technology.

Current and proposed business ventures in space include pharmaceutical production, semiconductor processing, space processed glasses, and in-orbit servicing. While the potential of these ventures to increase economic growth, provide jobs for our people, and improve the quality of life on earth are great, we must be cognizant of the dangers of overselling the potential applications of commercial space ventures. The maturation of this sunrise industry lies in the twenty-first century.

As the international competition in bringing commercial space technologies from the laboratory to the marketplace heats up, our nation cannot afford to pass up the opportunities presented by a domestic commercial space industry.

This Administration has recently announced a series of initiatives designed to facilitate the commercial uses of space. In announcing these initiatives, President Reagan stated that "We'll do all we can to ensure . . . that industry has routine access to space and a suitable, reliable place to work there. And we'll do this without needless regulatory constraints."

The National Policy on the Commercial Use of Space stresses that private sector investment and involvement in commercial space activities is essential if the enormous commercial potential of space is to be developed. Specific initiatives proposed to implement this National Policy include:

Economic Initiatives: Ensuring that commercial space ventures are not discriminated against by outdated tax laws or regulations.

Legal and Regulatory Initiatives: Laws and regulations predating space operations need to be updated to accommodate commercial space ventures.

Research and Development Initiatives: In a partnership with industry and universities, the government should expand basic research and development which may have implications for investors aiming to develop commercial space products and services.

Initiatives to Establish and Implement a Commercial Space Policy: The long-term nature of commercial space ventures requires consistent long-term government policy.

To oversee the implementation of these initiatives, the Administration has established a Cabinet level working group chaired by the Department of Commerce, with a NASA representative as the Vice-Chairman.

NASA's role in encouraging commercial space ventures is grounded in the agency's research and development mission. The objective of a NASA commercial use of space policy would be to support, through the agency's unique expertise and capabilities, the development of new commercial space technologies.

NASA's approach to expanding private sector investment and involvement in commercial space activities would result in the strengthening of the industry/university/government partnership responsible for so many of NASA's successes. Such an approach would also leverage industry's past investments in space technology with NASA's facilities and unique space research and technology expertise.

For example, an initiative which could be considered by NASA could involve our support to an industry/university/government team that would perform research in areas which industry feels have significant commercial potential. Potential high technology areas would include: electronic materials, metals and alloys, glasses and ceramics, biotechnology, fluids and transport phenomena, and combustion sciences.

Other examples of NASA commercial space initiatives that would be based on the long-term technology partnership that has evolved between NASA, industry, and our nations univeristies would involve increasing non-aerospace access to NASA facilities, making qualitative and quantitative changes to NASA's research programs, and reducing institutional barriers by facilitating shuttle integration procedures and expediting NASA partnership agreements with industry.

NASA currently encourages private sector participation in NASA's ground and space based research and development experiments through cooperative efforts known as Joint Endeavor Agreements. During this most recent Shuttle mission, Americans watched as the first non-astronaut payload specialist, Charles Walker of the McDonnell Douglas company, operated a device known as the Continuous Flow Electrophoresis System (CFES). Conducted under a NASA JEA, the CFES experiment may generate the first space processed drug used in human testing.

Mr. Chairman, there can be enormous potential economic and social benefits associated with encouraging the commercial use of space. While it is important not to raise false expectations, it is important that the government take positive steps to facilitate private sector investment in space. The support of this Committee in focusing on commercial space issues has been appreciated and we look forward to working with you in this regard in the future.

That concludes my prepared statement. I would be happy to answer any questions.

[The following information was subsequently received for the record:]

QUESTIONS OF SENATOR GORTON AND THE ANSWERS THERETO

Question. NASA has contracted with two private companies to act as liaisons in increasing the awareness and interest of non-aerospace companies in space commercialization opportunities. What is NASA's progress-to-date in this effort, and what impact do you expect the National Policy on the Commerical Use of Space to have on the participation of non-aerospace companies and venture capital firms in commercial space activities?

Answer. NASA continues to work with Booz-Allen Hamilton and Coopers and Lybrand as intermediaries to increase the awareness and interest of non-aerospace in commercial space opportunities. NASA believes that the progress of these intermediaries today has been satisfactory.

Implementation of the National Commercial Space Policy will reduce the technical, financial, and institutional risks of doing business in space which should help increase the participation of non-aerospace companies and venture capital firms in commercial space activities.

By reducing the technical, financial, and institutional risks of doing business in space, the National Policy on the Commercial Use of Space will help to increase the participation of non-aerospace companies and venture capital firms in commercial space activities.

Question. Concerning NASA's own space commercialization policy, what options is NASA considering in making its facilities and expertise more available to the private sector?

Answer. One of the initiatives NASA is studying to increase private sector involvement in commercial space activities involves increasing the availability of NASA facilities and expertise to the private sector. This initiative may encourage expanded participation of small and large non-aerospace firms in the commercial use of space, and make it easier for industry and universities to prepare for space flight without major investments in specialized equipment.

This initiative may be patterned after industry's use of NASA's aeronautical research facilities, which has proved mutual benefits for both the aircraft industry and NASA.

Question of Senator Trible and the Answer Thereto

Question. You have referred to joint research teams of industry, government, and universities—some have called these Centers of Excellence. How many Centers do you expect to be established? When would NASA seek authorization and funding for these Centers? When will factors and guidelines governing the location decisions for these Centers be developed? Will Congress have the opportunity to review these guidelines.

Answer. Since the establishment of the Office of Commercial Programs, NASA has been in the process of developing guidelines that could provide the basis for establishing National Centers of Excellence. As was discussed during the Senate Space Subcommittee hearing, NASA is developing a solicitation on Centers of Excellence which may be released in the Commerce Business Daily sometime this winter.

NASA expects several Centers of Excellence to be established in the near term. Funding for this activity may be reflected in the President's FY 1986 budget request. NASA fully anticipates providing members of Congress and their staff an opportunity to review the Center of Excellence guidelines once published in the Commerce Business Daily.

Questions of Senator Heflin and the Answers Thereto

Question. One of the legal and regulatory initiatives included in the White House National Policy on the Commercial Use of Space was to replace the Munitions Control Act and the International Traffic in Arms Regulations (ITAR) for private space launch regulations.

Answer. NASA defers to the expertise of the Department of State and the Department of Transportation.

Question. At the time the White House initiatives were announced, NASA indicated that it would try to reprogram $8–10 million to establish an Office of Space Commercialization and to initiate National Centers of Excellence.

(a) Would you please give the Committee an update on this activity? (b) Could you give us an indication of how the proposed NASA Office of Space Commercialization would interface with the Cabinet Council on Commercial Space that would be chaired by the Department of Commerce? and (c) Would you please give us an indication of why the lead on commercial space policy was given to a Cabinet Council and not a high-level NASA office, despite NASA's mandate to "seek and encourage to the maximum extent possible, the fullest commercial use of space?

Answer. Since the establishment of the Office of Commercial Programs, NASA has been in the process of developing selection criteria that could provide the basis for establishing "National Centers of Excellence." As was discussed during the hearing, NASA is developing a solicitation on Centers of Excellence which may be released in the Commerce Business Daily sometime this winter.

NASA will support the Cabinet Council on Commercial Space in the further development and implementation of the National Commerical Use of Space Policy. A NASA representative will serve as the Vice-Chairman of this Cabinet Council.

The lead for this activity was given to a Cabinet Council rather than NASA's Office of Commercial Programs because the Cabinet Council will be focusing on national level commercial space initiatives. The Office of Commercial Programs will provide an Agency focus for the development of NASA level policies which support the National Policy on the Commercial Use of Space.

Question. Aerospace America in this month's "Spotlight" section describes the White House National Policy on the Commerical Use of Space as:

". . . another ho-hum space policy. Following past patterns, President Reagan's lackluster "National Policy on the Commercial Use of Space," although it offers some worthwhile tax benefits, supports related R&D and public awareness, and eases some obsolete regulation, omits such important issues as Shuttle pricing and expendable launch vehicle operations and lacks new incentives for private-sector development. Thus, it opens the door to the formation of high level commissions."

Answer. The focus of the National Policy on the Commercial Use of Space was on opening up space to commerce, experimentation, and development in order to make life better on earth and encourage economic growth. Approved tax initiatives include eliminating discriminatory tax provisions that serve as a financial barrier to commercial investment in space. The *Aerospace America* critique neglects to mention the existing policy directives which are germane to Shuttle pricing and expendable launch vehicle operations (National Security Directive #144 and Executive Order 12465, respectively).

Additional commercial space initiatives which may be considered by the Cabinet Council in the coming months include Shuttle pricing and additional tax issues. The objective of these tax initiatives would be to put space-based businesses on an equal footing with terrestrial-based enterprises.

Question. Finally, if I have the correct impression, NASA will soon announce a series of commercial space initiatives that can be undertaken within the authority of the National Aeronautics and Space Act, i.e. they will not require legislative action.

Could you please give the Committee a status report on the NASA commercialization initiatives and what type of initiatives are being considered? Is there any need for further amendment of the National Aeronautics and Space to facilitate and enhance NASA's role in commercial space activities?

Answer. One of the initatives is the formation of NASA's Office of Commercial Programs. That office is studying a series of initiatives which have been formulated in order to lessen the financial, technical, and institutional barriers to doing business in space. Some of these initiatives may appear in the Administration's FY 1986 budget submission to Congress.

NASA feels it has sufficient authority under the National Aeronautics and Space Act of 1958, as amended, to proceed in the development of these commercial space initiatives. However, NASA is looking at changes which may be useful.

Senator GORTON. Thank you very much, Mr. Evans.

I think I will ask questions of you in the order in which you testified. So, Mr. Gillam, would you describe the potential market for a commercial American ELV industry?

Mr. GILLAM. Today, Mr. Chairman, that market is limited, in our belief, to commercial communication satellites. There are currently, say this year, and next year, and the following year, a demand for approximately 20 commercial satellite launchers per year. There are various projections of growth rates for this market that range from 7½ percent per year to 15 percent per year.

Senator GORTON. That is increase or share of the total space market?

Mr. GILLAM. Increase in demand for communication satellites.

Senator GORTON. Just within communications?

Mr. GILLAM. Just within communications.

Senator GORTON. Where, beyond communications, do you see a future demand?

Mr. GILLAM. Currently there is a possibility, and there are discussions going on within the Department of Commerce, of commercial remote sensing satellites. That is also an arena that has a great deal of potential for commercial launch systems.

Senator GORTON. Any other?

Mr. GILLAM. Not that I can see, sir. Most of the commercialization thrusts that Mr. Evans has been talking about are space shuttle dependent, because you have to bring the payloads back to Earth, and the only vehicle that is capable of doing that that is currently flying on a large scale, say with the shuttle payload, is the space shuttle.

Senator GORTON. Mr. Evans, would your views be identical to Mr. Gillam's on this subject?

Mr. EVANS. Yes, sir.

Senator GORTON. What problems, Mr. Gillam, if any, do you foresee in conducting U.S. commercial launches from national ranges?

Mr. GILLAM. I only see minor procedural problems. The first launch though may have some difficulties in terms of administrative difficulties, but since NASA has been conducting for an extended period of time commercial ELV launches—and we call them commercial ELV launches—they are operated by NASA, but they are launches for the commercial sector—I do not see any substantial or significant problems in having these launches from Government ranges.

As you know, sir, the policy which calls for the allowing of private sector ELV launches encourages the use of national ranges, and from the experience that we have had with these launches, we do not see any major problems associated with doing so.

Senator GORTON. The proposed legislation before us directs the customer who purchases Government launch assets to reimburse the Government for the fair market value of the asset.

Can you comment on that, and comment on how that relates to your present charges for those services?

Mr. GILLAM. We looked at that when we were given the assignment by the Administrator of NASA to look into how would we implement the transfer of Government ELV systems to the private sector, and we looked at the fair market value as a measure.

We did not recommend that to the Administrator because it was difficult to determine what fair market value was. It is a judgment call that lies somewhere between nothing and infinity. If you have only one bidder, he is in an ideal position to bid the minimum. And so fair market value is what he bids. If you have a competition, then you may have an entirely different situation. So we recommended that another specific formula be used which was more definitive.

Senator GORTON. Namely?

Mr. GILLAM. We recommended that we depreciate the equipment, the equipment that was over 10 years old; we recommended that it be considered depreciated, and that a very minimal charge be made for that. And other equipment that still had a useful life, that it be based on a depreciated value which could be done by formula, maybe using an IRS formula or some other.

Senator GORTON. I take this formula was reasonably favorable toward the private commercial——

Mr. GILLAM. Absolutely. Absolutely.

Senator GORTON. On the broader issues of space commercialization, NASA has just released an RFP for a shuttle marketing contractor to manage the marketing of shuttle payload capability to commercial, domestic, and foreign users.

Could you give us some insight into how you perceive this shuttle marketing initiative functioning, and the kind of opportunities which it offers?

Mr. GILLAM. It apparently offers a great deal of opportunity to the private sector since there is such extensive interest on the part of the private sector in that RFP. However, the RFP is a support service RFP, wherein NASA would be purchasing from the private sector the kinds of capabilities that the Government does not ordinarily have, providing certain types of market analysis support and other support to NASA in its marketing efforts.

We have been informed that the private sector interest in this RFP which is rather extensive is that it offers the potential that if NASA decides to spin-off the marketing function, just as it is spinning off its expendable launch systems, the person who has that contract would probably have an inside track for such a spin-off. And that is the reason it has created such external interest. But it is in the support service category, as opposed to the management category, and it will provide support to the Government effort.

Senator GORTON. Mr. Evans, this committee's fiscal year 1985 NASA authorization directed the administration to establish a high-level office within the agency to act as a focal point for space commercialization.

What is the status of that effort?

Mr. EVANS. It is very close to being issued. Mr. Beggs, in testimony about a month ago, said he would have it done before the end of the summer, and while it seems like the end of the summer, we really have until the 22d, and I think we will beat that date.

Senator GORTON. Thank you.

Concerning the national policy on the commercial use of space, were there initiatives under consideration by the Cabinet council which were excluded from the policy? And, if so, why?

Mr. EVANS. Yes, sir; they were. And the reason is what I mentioned in my opening remarks. There was a philosophy that permeated the initiatives, and that philosophy was that we should not be giving direct subsidies to one industry over another. Rather, what we should be doing is eliminating barriers; we should be eliminating discriminatory tax provisions; we should be assuring that the Government performs its function to the greatest extent possible of doing and encouraging basic research; and we should work very hard to establish a strong, dynamic partnership with industry and academia. And that is the direction that these initiatives took, as opposed to a subsidized direction.

Specifically, we did not go forward with guaranteed loans, those kinds of provisions.

Senator GORTON. Can we anticipate other space commercialization initiatives from the Cabinet council?

Mr. EVANS. I think you can. There are three that the President has asked the group to study over the coming months. One is one that everybody is probably more familiar with than they would like to be, and that is the shuttle pricing issue.

The other deals with two other tax issues, one regarding free services from the Government to industry and whether these should be taxable. Finally, there is a question of whether the unique aspects of doing business in space requires some unique tax provisions. So we will look at those three.

Senator GORTON. In your testimony, your written testimony, you mentioned the international competition in bringing commercial space technology from the laboratory to the marketplace.

Could you compare our Government's space commercialization efforts with those of our foreign competitors?

Mr. EVANS. Today, without doubt, we are in the lead. We have done more experiments, with the possible exception of the Russians, but in terms of the free world we have done more experiments than other countries. We have got the vehicle for doing it, and we are making a lot of progress.

The issue becomes can we move from doing science into actually moving the new technology that we learn in our science programs to market? And that is where we believe this increased emphasis on a partnership with industry and the universities will be very important for getting us to the market, and that is why we are proposing that we form what we are calling centers of excellence for lack of a better term, but areas where we can get industry to work hand in glove with the Government and with universities to see what commercial potential some of the new science has.

Senator GORTON. According to your testimony, one current or proposed space business venture under consideration is in orbit servicing. While NASA capably repaired the Solar Max Observatory during its 11th space mission, are there, as your testimony implies, commercial entities interested in providing that kind of service?

Mr. EVANS. There is at least one company that is actively looking at that. They would prefer to remain proprietary at this point, but I can tell you that it is a major company that is taking a serious look at that.

Senator GORTON. Senator Trible.

Senator TRIBLE. Thank you, Mr. Chairman.

Let me address my few questions in reverse order, starting with Mr. Evans, if I might.

Mr. Evans, a basic assumption is that the ELV's and space shuttle are complement, and indeed they are. Tell us, if you will for the record, something about the interplay between ELV's and the shuttle. For example, which of the commercial uses of space might be more likely to utilize the ELV than the shuttle? What are some of the advantages an ELV might have over the shuttle for some of these potential commercial uses, the disadvantages? How do you use one and the other together?

Mr. EVANS. I think Mr. Gillam touched upon that in his remarks. Obviously, you can't use an expendable launch vehicle for something that requires manned intervention, or for something that requires going up and coming back.

So we automatically have to take all of those classes of payloads and move them to the shuttle. You then have an open question as regards to whether it more efficient and effective to send the remaining payloads up by expendable launch vehicle or by the shuttle, and you get into a lot of national policy issues as you look at that. Obviously, it's technical feasible for expendable launch vehicles to do communication satellites, to do remote sensing satellites, and obviously both of those have commercial implications.

It probably will boil down to a decision by the Nation regarding how important is it to utilize the shuttle and get high rates which bring down your costs, your fixed costs, thereby encouraging the new high-technology ventures that need the shuttle, versus how much does the Nation want to encourage either a backup or a complementary private set of expendable launch vehicles. And that is something that very high levels of the administration and Congress are going to be able to settle, because in all the debates that I have been through with all of the interagency working groups, you find it automatically breaks into those that have institutional reasons for taking one position or the other.

Senator TRIBLE. Obviously, the forces of the marketplace would influence the result as well.

Mr. EVANS. I certainly hope so. I think that's the best way to do it. I hope we get to that stage.

Senator TRIBLE. Right, sir. Well, that is the rationale, I guess, for being here today in large part.

You mentioned the high-risk nature of space commercialization, and obviously the administration is taking steps to promote commercialization and reduce those risks and some of the attendant costs.

You touched on this, gentlemen, but I would like you to focus specifically on this question. In addition to this bill and the tax initiative envisoned by Senator Gorton, what can this Congress do, or what can the Congress do to encourage commercialization of space?

Mr. EVANS. There are three areas in which risk needs to be reduced. One is financial, and I was very gratified to hear the chairman talk about trying to move on some tax legislation. I think that is critical.

The second area that we have got to worry about are institutional risks. I think the President's policy is a great step in terms of helping reassure industry that the Government will remain behind doing commercial ventures. I think the committee's efforts on the expendable launch vehicle area and trying to streamline the regulations of that is also very important.

We have others. Proprietary information concerns is one that I mention. Making sure we get quick decisions on communications regulations is another.

The third area of risks that we have got to reduce is technical. And I think that is where NASA becomes involved. We are very concerned with making sure that we do the appropriate basic research that forms the foundtion for industry and moving things along, as we talked about earlier, to the market.

Obviously, Congress can help there. Let me put a little plug in for NASA. At some point, we are going to have to ask you for some money, and we will hope that you will look favorably on that.

Senator TRIBLE. It does always seem to come up in our discussions.

Mr. EVANS. Unfortunately.

Senator TRIBLE. Let me ask you, Mr. Evans, I am interested in the concept of joint research teams: industry, Government, and the academic community that you and others have called the centers of excellence. Can you be more precise in what it is that you envision and what kind of timetable we might be able to anticipate for congressional response?

Mr. **Evans**. Yes, sir. We are in the process of developing a solicitation on the centers of excellence now. We are very hopeful that we will be able to release that in the Commerce Business Daily some time this fall. We have and will continue to consult with your staff members, or if you are personally interested, or anybody else, with what specifically is in the solicitation.

In general terms, we have laid out criteria upon which we will judge the proposals that come in. We intend to try to make it as rigorous a process as possible. The key, probably the highest priority criteria, will be that we leverage the Government's money. We want to try to reduce the impacts, given these tight fiscal times, so we will look for private contribution to the centers of excellence, and we will also look for State and local government contribution, and maybe to some extent universities, to the extent they might have an extra building or an extra room or something where some of the work can be done.

But the point is, we believe it is very important to create a true partnership, and that requires everybody putting something, bringing something to the table.

Senator **Trible**. Well, I certainly hope that you will keep us abreast of the progress of that idea. I know that there are many Members of Congress that look favorably on that proposition and would like to see it succeed.

Mr. **Evans**. Thank you, Senator.

Senator **Trible**. Mr. Gillam, let me ask you just one question, and then I am going to submit some questions for the record so we can move on. I may ask you two questions.

First, my parochial interests were piqued a bit by your mentioning Wallops Island, VA as one of the sites where privatized Scout ELV might be launched. Can you flesh out that enterprise a bit? Tell me more about what you are thinking.

Mr. **Gillam**. What we are thinking is that in line with the policy, we had requests for a Delta and Atlas Centaur, and we knew that there was interest. We did not advertise the transfer of the Scout to the private sector, because there had been no expression of interest. We received such an expression of interest from SSI recently. We advertised in Commerce Business Daily, and the expression of interest included the possibility of launching the Scout system from Wallops Island and from Vandenberg. So, in our announcement, we offered to turn over the entire system.

What we would envision is that a private sector operator could take over early, before the last Government mission, the operation of the Scout system at Wallops and at Vandenberg. There is a base of Government missions through 1987 at least that could assist this private sector firm in getting off the ground in a manner similar to that proposed by TCI, but we do not have any specifics that we can tell you with respect to what the plans might be of the private sector firms, since we have only received the letter.

We are beginning discussions with them, and we will be able to keep you informed later as to what those activities might be and what their specific interests are.

Senator TRIBLE. I would like to express an interest in that enterprise, and if you could keep us advised——

Mr. GILLAM. We will do that, sir.

Senator TRIBLE. I would appreciate that very much.

One final question, if I might. Mr. Gillam, I will direct this to you for symmetry. We have been posing most of our questions to Mr. Evans, it seems.

A major objective of the Commercial Space Launch Act is to expand private sector investment in commercial space transportation. My understanding is that commercial investment in this area is not limited only to expendable launch vehicles. Based on your experience, can you describe some of the investments in the past that both the aerospace and nonaerospace companies have made in commercial ventures associated with the space shuttle?

Mr. GILLAM. There are several ventures that have made substantial investments in the space shuttle. As you know, McDonnell Douglas has invested in the neighborhood of $70 million based on our estimate, in the PAM D-1 and D-2 systems. PAM stands for payload assist module.

There is a Pittsburgh firm who has invested about $3 million in a study effort. It is called Astrotech International. That study effort has been completed, phase A and B, and they are proceeding in phase C, which is hardware building, for what they call the Delta transfer stage. That investment is estimated to be in the neighborhood of $40 to $50 million to develop such a stage.

There is the Orbital Sciences Corp., who has issued a public offering and has raised approximately $60 million for the development of what they call the orbital transfer stage.

Astrotech International has also invested nearly $10 million in developing a payload processing facility right outside the Kennedy Space Center which will augment the Government's capabilities to process payloads, both for the shuttle and probably for commercial ELV's.

So there are many instances such as these that can be cited. There is also a McDonnell Douglas investment in materials processing which is shuttle related. So we estimate that in the shuttle itself, there has been a commercial investment level of nearly $200 million to date.

Senator TRIBLE. Well, that is not an insubstantial amount of money, even by Washington standards.

Mr. GILLAM. No, it is not.

Senator TRIBLE. Well, I appreciate your testimony, gentlemen. And, Mr. Chairman, I may have some additional questions as we flesh out the record. If so, I will submit those for the record.

Senator GORTON. We are likely to do so as well, as will Senator Heflin.

Thank you both very much.

The second of our two panels will consist of the vice president of General Dynamics, Mr. Rector, and the president of Space Services, Inc., Mr. Slayton.

Mr. Rector, you may proceed, and we can inform each of you, as we did the previous witnesses, that your entire written statements will be included in the record as if read. So if you wish to summarize, you may, without losing that formal testimony.

STATEMENTS OF WILLIAM F. RECTOR III, DIVISION VICE PRESIDENT, SPACE PROGRAMS, GENERAL DYNAMICS, CONVAIR DIVISION; AND DONALD K. SLAYTON, PRESIDENT, SPACE SERVICES, INC.

Mr. RECTOR. Thank you, Mr. Chairman. Mr. Chairman and Senator Trible, it is a privilege to appear before this distinguished committee on behalf of General Dynamics to comment on space commercialization and privatization of expendable launch vehicles.

My observations today will focus on issues relevant to the proposed legislation being considered by this committee. Our views on this matter result from three years of very serious assessment by our company, including numerous interactions with potential customers and responsible U.S. Government organizations.

We would like to commend Senator Trible for his introduction of the Commercial Space Launch Act. We are also gratified to see support by the cosponsors.

The timing of these hearings is most appropriate in light of the near-term key milestones that we feel must be met if management and implementation of responsibility for current U.S. Government launched vehicle programs is to be transferred to the private sector. We have studied what we believe the effect of the bill S. 2931 will be in relationship to these key milestones, as well as the ultimate success of a commercial launch program.

We also recognize the need for legislation to provide the Department of Transportation with the authority to issue and enforce licenses within regulatory constraints.

A simplified regulatory process, as outlined in the pending legislation, is welcomed. We wholeheartedly endorse the Commercial Space Launch Act, S. 2931, as well as its intent.

We were greatly pleased by the issuance of the space policy covering commercialization of ELV's by the President last year, and later the designation of a lead agency, the Department of Transportation, the ground rules of that agency or the charter of that agency to encourage and facilitate commercial ELV activities by the private sector. These two actions have helped our efforts to transition our existing systems and their derivatives to a commerical program in a cost-effective manner. The DOT has beem actively assisting us in an attempt to solve some of the remaining issues; most notably, the negotiation of agreements for the use of production, launch, and range facilities.

General Dynamics' attempt to transition our current launch vehicle systems through a commercial program is based on using the experience acquired over the past quarter century. The first flight of the Atlas rocket in 1957 occurred a few months before the Soviet Union successfully launched the first sputnik. Our Atlas missions include such outstanding space programs as Mercury, Ranger, Mariner, NOAA, Navstar, and others. More than 25 years later, 478 Atlases have flown, 195 of them as space launch vehicles.

At this very minute, Atlas 14-E is poised on a launch pad at Vandenberg Air Force Base, ready to launch a Navstar satellite for the global positioning system. This will be the 11th Navstar to be launched by the Atlas launch vehicle.

Shortly after the first Atlas flight, work began on this Nation's first high energy upper stage, Centaur. More than 20 years since its first flight, Centaur has been the upper stage on 62 Atlas Centaur vehicles and 7 Titan Centaurs. Atlas Centaur has launched more than a third of the 82 commercial communication satellites that have been launched from the United States. Many scientific and nearly all planetary and interplanetary missions of the United States have been launched on either or both Atlas and Centaur. Such highly successful programs as Surveyor, Pioneer, Viking, and Voyager were launched by these systems.

This is a proud legacy, and we seek to continue.

With the advent of the space shuttle era, General Dynamics has continued to contribute to the U.S. space effort. We are proud of our role in designing and building the midfuselage for the space shuttle orbiter. We are on schedule with the modification of Centaur for use as an upper stage space shuttle for NASA planetary missions Galileo and Ulysses. In addition, the DOD is jointly involved in this program, and we will be providing Shuttle/Centaurs for key military missions that require high energy performance.

These comments on the background and current status of General Dynamics' participation in space programs are intended to provide some insight into the factors which have led us to today's discussions: a strong belief that there is a continuing for the mature, proven, expendable launch vehicle systems which have performed so well over the years. What I would like to do is put the question of commercialization of ELV's into a broader context—how this commercialization can further enhance the U.S. space program, national security, and economy.

There appear to be three broad commercial areas where space is already, or soon will be, playing a major role. These areas are: Information transfer, materials processing, and energy. In some cases, involvement either with the space shuttle and/or the space station is necessary. The space shuttle itself was envisioned from the beginning as only one element of a complete space system which includes manned space stations, orbital transfer vehicles, and possibly geosynchronous platforms.

The space shuttle was conceived as a reusable vehicle that could transport crews and payloads to Earth orbit. The presence of man increases the space shuttle's flexibility for mission implementation. Extra-vehicular activity, problem solving, and on-orbit repair capability are significantly increased. Only a vehicle such as a space shuttle could make possible the prospects of convenient space station logistic support, retrieval and return to Earth of low altitude spacecraft, commercially produced products such as pharmaceuticals, or valuable test samples which had been left in orbit.

As a corollary to the planned development of the space shuttle, the U.S. Government made a conscious decision to phase down and eventually terminate ELV programs, with the expectation that the space shuttle would be able to handle all available traffic at a cost and schedule to satisfy all potential customers.

ELV's were destined to go out of business by the early 1980's. Projected space launch traffic demands have been thoroughly examined by the U.S. Government and private groups, including ourselves. There is an expanding launch demand with a class of satellites particularly suited for ELV's, the geosynchronous communication satellites.

At General Dynamics, we conservatively project the need for launch services for approximately 200 commercial communication satellites between 1986 and 1995. This market represents over $10 billion in potential launch vehicle revenue over this 10-year period. This class of commercial user places a high premium on dependability of schedule, which the prime merit of the ELV's in their view and our view.

When commercial communication satellite requirements are considered in conjunction with planned DOD, NASA, and other U.S. Government missions, we believe the demand exceeds the capability of its space shuttle. NASA has manifested payloads to fill the projected high launch rates the orbiter fleet is capable of attaining. This rate projects a sharply upward learning curve which exceeds the NASA experience to date. With a scheduled shortfall, the commercial satellites have the lowest priority as an overflow develops. ELV builders have a real incentive to participate and launch some of that overflow and let the shuttle perform the tasks it is uniquely suited for.

This schedule uncertainty is the prime reason that the European Ariane launch system has emerged as a formidable competitor to U.S. system with an advantageously sized booster system, progressive financing strategies, substantial financial backing from governments, and aggressive marketing. Ariane should not be allowed to take over the ELV business unchallenged. Commercializing today's proven U.S. ELV's will provide a capability to accommodate the overflow in launch requirements in direct competition with Ariane.

We must also consider the need to complement the space shuttle. Our own experience over 26 years shows that unforseen delays caused by technical problems or untimely hardware anomalies can inject schedule perturbations unacceptable to either DOD or NASA. Commercial ELV's can provide a ready alternative.

Commercial success of the ELV's may create some unloading of the space shuttle manifest, but this could be viewed as an encouraging event since it will open up greater opportunities for using the unique properties of the space shuttle: its size, the use of man, and its demonstrated servicing and retrieving capabilities.

It has also been argued that in general, in the general spirit of free enterprise, coexistence of both the space shuttle and U.S. ELV's will have the beneficial result of making both systems operate more competitive and, hence, more efficiently. We certainly feel that this principle will be in full force among the various ELV options will be available as commercialization is permitted to proceed. Indeed, we do not ask for nor wish to see any favored status of one system over another.

As I stated at beginning of my remarks, we, at General Dynamics, have been pursuing the possibility of commericializing our current Atlas/Centaur system and derivatives for 3 years. In April of 1982, after 1 year of assessment and analysis, we expressed our interests in proceeding with such a venture in letters to both NASA and the U.S. Air Force. This was followed by a formal proposal to NASA in January 1983 to continue the Atlas/Centaur on a commercial basis. In December 1983, NASA announced the selection of our company as the operator of the commercial Atlas/Centaur program, subject to negotiation of a formal agreement. We appreciate the difficulties involved in this transition of valuable national assets and capabilities to the private sector, as well as the magnitude of the effort expended by the many U.S. Government agencies in order to assure that this process is orderly and in the best interests of the United States.

Mr. Chairman, precedents have been set for private operation of U.S. Government developed assets. This practice has been well-established in the aircraft, railroad, steel, and other industries. Now we believe there is an excellent new opportunity to encourage the privatization of a valuable national resource which has taken many years and many millions of dollars to develop, and thus preserve it for a long-term benefit to the economy and security of our country.

It is our sincere belief that the space shuttle and ELV's can comfortably coexist and do so to the benefit of the Nation, each providing the services for which it is best equipped. Commercialization of the ELV's by General Dynamics and other firms will be an important step toward a broader base of industrial space-related activity.

Mr. Chairman, we solicit the support of the subcommittee toward these ends, and I appreciate the opportunity to present our views. I will be pleased to respond to any questions.

Mr. SLAYTON. Chairman Gorton, Senator Trible, I appreciate the opportunity to visit with you here this morning.

SSI was founded in September 1980 by David Hannah, Jr., and has as its objectives the development of cost-effective market-oriented launch vehicles, launch services, space and satellite systems.

We commend this subcommittee for taking the lead in encouraging new, small companies like ours to develop commercial space programs. We think Public Law 98–365, Land Remote Sensing Commercialization Act, is landmark legislation to which the current bill S. 2931, the Commercial Space Launch Act, is a logical and necessary follow-on in the development of private enterprise in space.

Your support for entrepreneurial space efforts has inspired us to continue to pursue the challenge of commercialized space. We strongly support the bill.

Private sector involvement in space presents new issues which your legislation resolves in a way that is fair to our infant industry and we think responsive to the public interest. We are pleased that the subcommittee has chosen to place comprehensive authority in a single agency, the DOT. By designating DOT as the lead agency responsible for encouraging and facilitating private ELV operations and providing DOT with authority to issue launch licenses, your legislation will streamline future ELV clearances. Enactment of the bill will provide the U.S. ELV industry with the certainty needed to attract our investment, as well as a regulatory climate to its manning our customer base.

We believe development of a commercial U.S. ELV industry will not conflict with the shuttle program. The national interest demands maintenance of the Government's space transportation system. The unique capabilities of shuttle will maintain its position as an important space project. At the same time, we think an ELV industry can respond to market demand. A carefully crafted government policy can ensure that NASA and the private sector activities are complementary rather than competitive. S. 2931 and its House companion bill meet this requirement.

SSI's Conestoga series of launch vehicles were developed to fit a market niche not targeted by shuttle or the larger ELV's that Bill just talked about, and therefore we feel are complementary and not competitive with those vehicles. Our launch vehicles offer the smaller payload operator an opportunity to launch into any orbital inclination that they need and, more importantly, on their schedule. Currently these small payloads are subject to the orbits and the schedules of the larger payloads with the resultant inefficiencies. We believe our decision to market smaller, low earth orbit vehicles will increase demand for such services once the benefits of the greater flexibility and dedicated launch services are realized.

Your legislation, along with the Executive order, has already encouraged an expanded role for private sector involvement in ELVs. We recently embarked on a domestic and international marketing campaign of the Conestoga series of launch vehicles. The DOD's new Office of Commercial Space Transportation assisted us in examining private sector use of the Air Force western test range at Vandenberg and NASA's launch facilities at Wallops Island.

We received an excellent reception at both of those places, incidentally. And, to enlarge on your question, Senator, the management at Wallops was very, very supportive, and we had a dual objective there. One was to look at the use of Wallops Scout facilities for our Conestoga, and secondly, to look at the commercial operation of Scout. And it is more than adequate to support our requirements in both of those areas.

The reason we had not looked at Wallops earlier was because this location is primarily conducive to only easterly launches, and we were looking at payloads that required fuller launches. But we had recently planned some easterly launches, and that makes it now a very desirable location.

We have very good interaction with the DOT and the other government agencies relative to launch sites, and we are looking at some clearly private commercial facilities also, both internal to the U.S. and outside the boundaries.

As you know, we launched the Conestoga once from a private site due to the absence of a policy allowing for private ELV launches in Government facilities and the lack of a regulatory guidance for user's fees. Our experience working with the Government to obtain the necessary clearances for the first privately funded and operated launch, Conestoga I in 1982, set a crucial precedent regarding the regulatory framework in which commercial launch ventures operate. The U.S. Government made certain technologies available to us. They did clear the regulatory barriers which might have prevented us from accomplishing our goal. However, there were multiple agencies involved which complicated the approval process.

Moreover, the lack of a clear policy guidance resulted in a significant expenditure for legal fees just to penetrate the regulatory morass.

And, finally, in the absence of statutory authority recognizing the existence of private sector ELV's, our financing and marketing efforts were handicapped.

We urge that the Senate act quickly on the bill so that our next launch vehicle and site clearance process is streamlined and our investors and potential customers assured of a certain and prompt process.

If the United States is to maintain its leadership position in space, the private sector must take advantage of the tremendous accomplishments of NASA, quickly developing a resource in space for the benefit of society. The Government has fulfilled its responsibility both by assuming early risks and by providing initial technical and economic infrastructure required for subsequent development by industry. SSI wants that industry to be American. Taxpayer moneys were used to fund NASA developments, and we believe those taxpayers should benefit from their investments through the development of new U.S. industries.

Once again, foreign groups are exploiting the U.S.-developed technology. We cannot afford to lose this new industry to subsidized foreign competition. I have already mentioned the Ariane and their marketing efforts and the probability of Japanese commercialization of U.S. technology is increasing. We do not need any new Government subsidies, but we do need clear policies enacted in the law which will allow us to compete in the world market.

Historically, the United States has opened and developed new economic, scientific, and physical frontiers by fostering cooperation between Government and industry. We believe the bill fosters such cooperation and the development of a U.S. ELV industry.

Mr. Chairman, we commend you and members of the subcommitee for your superb contribution to the growth of our industry. We look forward to working with you to develop legislation that will allow and encourage the commercialization of space.

Thank you very much.

[The attachment referred to follows:]

Space Services Inc. (SSI) of America Comments on S. 2931

(1) Sec. 4(12)(C), page 6. Subsection (12)(C)(ii) is somewhat confusing on the issue of U.S. corporations operating launch sites inside the terrority of a foreign nation. It appears the SSI would no longer be defined as a "United States citizen" if we were to operate a launch site or to launch a vehicle in the terrority of a foreign nation. SSI qualifies under paragraphs (A) and (B) of Subsection (12) and we want to be regulated as a "United States citizen" under Sec. 6(a).

(2) Various provisions of the Bill include references to "public health and safety, and national security and foreign policy interests". SSI supports the involvement of relevant Federal agencies to insure the Secretary of Transportation protects these four obligations but we hope the interagency consultation process does not unduly delay licensing approvals. Also, SSI would hope that regulations issued under the Act identified clearly the conditions that must be met by ELV companies to fulfill those four obligations.

(3) Sec. 10(c), page 11. SSI has asked a space insurance company to review S. 2931, specifically those provisions which impact our liability insurance coverage. It is not clear that or business insurance would insure against the possibility of the U.S. government causing a last minute scrub of a launch. At this point it appears we would have no recourse for reimbursement for lost expenses but we will submit any additional information we obtain from the insurance company.

(4) Sec. 12, page 12. We hope the regulations issued by the Secretary clearly define the considerations to be evaluated during a license application review. Clear guide-

lines will allow technical modifications needed to comply with the Act to be incorporated early on, thus avoiding additional costs.

(5) Sec. 13(a)(1), page 12. SSI is concerned that our competitors and/or our subcontractors' competitors may be allowed as "other designated individuals" to observe the production or assembly of our launch vehicle. We recognize the government's dependence on contractor personnel in this area but we would like to be consulted before such individuals are selected.

(6) Sec. 15, page 14. We have asked a space insurance company to review this provision as noted in comment #3. SSI does not have liability insurance in an amount "sufficient to satisfy international obligations" nor do we feel such an obligation is reasonable or obtainable from commercial sources. Again, we will submit any information on this matter which the insurance company provides.

Senator GORTON. Mr. Slayton, what makes you believe that there is a sufficient market to support an ELV industry, specifically in your class of launch vehicle?

Mr. SLAYTON. Well, I have a couple philosophical answers to that question. I will give you some materialistic ones. But I have been in the flying business for about 42 years, and throughout that period of time, people have tried to develop the universal flying machine or an all-purpose airplane, and we have never succeeded. And I do not think we are going to succeed in the space era either. I think the shuttle will not prove to be the only space machine, the only machine that can perform all the functions required in space, and therefore believe there is a niche for our little type vehicle, and I believe there is a niche for Bill Rector's type vehicle.

I think the shuttle does great things, but it cannot do everything for everybody.

Point No. 2. I read a little article the other day that indicated that anything the private sector duplicates that the Government is doing, they can do for about a third to half the cost. I think those numbers are probably exaggerated, but there certainly is some difference. And this is not because our friends in the Government, who I happen to be one of for a whole lot of years, are not dedicated, excellent managers, just because they are motivated different. The motivation of the private sector is to the bottom line, and the motivation normally of the Government employee is to low risk and high success, and you are willing to spend a lot of money and overlay a lot of things in order to obtain that. So inevitably, you pay a price for it.

To answer your question more directly, we are looking at a small market. We used the Battelle study, which I think everybody else has used also. And we have detected about three flights a year in there that we think are adaptable to our little vehicle, primarily Earth remote sensing type payloads, and many of them are foreign payloads.

As far as the U.S. market is concerned, we have come on a class of payloads which are commercial proprietary at this point, and I cannot discuss publicly. I would be willing to talk in private about it if you wish. But this is the one that developed our interest in going to Wallops Island, and we are looking at something like four to six flights a year in support of those, and we have had some other foreign interest in scientific-type payloads that adapt to our class of vehicle, again in some cases interested in us launching from foreign sites, and that of course is one reason for our concern about how we get authorized to launch from a foreign location. We want to retain our substance as a U.S. company, obviously. But we do not want to be in a box where we cannot launch——

Senator GORTON. That leads me to one of the other questions I had here. That would be to share your thoughts on the appropriateness of a DOT launch license for foreign operations.

Mr. SLAYTON. Well, my personal opinion is that it would be desirable, since we are a U.S. company and we want to remain one, to have the DOT certify and license our launch vehicle and our class of vehicles to launch worldwide. And we obviously need DOT authorization in licensing of any launch site, whether it be a current Government one or a U.S. private one.

I think it would also be desirable to have the DOT certify non-U.S. launch sites also, primarily because I believe many of the underdeveloped countries do not have a mechanism you could even flow through to do such a thing, and I believe they would feel much better about having us launch, knowing that our Government agency that is responsible for that sort of thing and highly knowledgeable in it had already looked it over and said it is OK. So we believe that would be highly beneficial.

There is one little kicker to that, however, and that gets into the issue of the payload type thing, and whether or not the DOT should or could regulate the non-U.S. payload. I will give you a very good example of why that could prove to be a problem. The land remote sensing bill today says that the Department of Commerce is the regulatory agency on land remote sensing, and all land remote sensing must be open skies, nonproprietary. An interesting question is if India came along, for example, and said hey, would you launch our land remote sensing satellite. We would like to be able to say yes, but if they now said but we want the date to be proprietary, how does that fit in the system?

I think there are some of those kinds of sticky issues that need to be addressed.

Senator GORTON. Thank you.

Mr. Rector, what problems do you foresee in conducting commercial launches from national ranges?

Mr. RECTOR. We have been operating from national ranges at the eastern test range since 1957, and the western test range since 1959. We actually not only build the Atlas and Centaur systems, but we are also responsible for launching them for the Government, so we have had a tremendous amount of experience, interactions with the Air Force, NASA, and other agencies in using those ranges, so we do not expect any problems because there has been a pattern established over all these years, and we do not foresee any problems at all in using the national ranges.

Senator GORTON. The proposed legislation before us directs in the case of a sale of Government assets such as an ELV, the use of fair market value of the asset. Can you comment on the appropriateness of that valuation method and your anticipation of negotiations with NASA on the transfer of Atlas/Centaur assets?

Mr. RECTOR. Well, as Ike Gillam talked about in his testimony or his questions and answers, this is an issue that goes from zero to infinity, and we are on the zero side of that.

The systems we are proposing to commercialize are systems that there's no question have been amortized over 25, 27 years. We are proposing to keep those systems in existence through the commercial route, and are willing to maintain those facilities, the launch facilities and so on, which deteriorate very rapidly. In fact, the Mercury launch pad that Deke knows so much about that was used for the Mercury program, that is all gone because it was too expensive on the part of the Government to maintain it for painting alone. Very costly.

So we are willing to maintain those and keep them in the condition they are today, so that in case of national needs, for security reasons or others, that they can be turned back to the Government. So we feel the fair market value is open to interpretations and negotiations, and that is what we are in right now. We think we are going to get an acceptable arrangement, but it is very important that we settle that soon so we can really determine what our final price is going to be.

We are willing to maintain those facilities and keep them available at no cost to the Government.

Senator **Gorton**. Both of you mentioned in your testimony the challenge from foreign competitors 'space market. Could you give us more insight into the nature of the competition, the degree to which it is either a benefit or a threat?

Mr. **Slayton**. Well, from our little vehicle point of view, we are aware, for example, that the Japanese are developing a small vehicle. The Indians would like to develop one. We are aware of about a half a dozen other countries around the world that have a strong interest in developing their own small launch vehicle capability.

We are trying to convince them that, hey, we have one that is designed and developed, and it is off the shelf, and we will give you a very good deal on it, better than you can do yourself. But we do not know—there is a lot of nationalistic interest, as you would imagine, on the part of many countries in having their own designed and built thing, whether it is economic or not. So we do envision some of that kind of competition.

We do not know of any direct competition to the United States at this point.

Mr. **Rector**. I would like to address first the Ariane system, which we of course feel very closely, since it is in direct competition to the current Atlas/Centaur system.

Prior to the Ariane system, Intelsat communication satellites had been launched by Atlas/Centaur systems since 1974, and up to 19 or 20 of them have been launched by the Atlas/Centaur. And now that launching of the Intelsat 5 series, the current series, is split between the Atlas/Centaur system and Ariane. We are currently launching ten of the Intelsat 5's, and Ariane 6. What the future holds, we do not know. But we very definitely feel the competition for the Ariane system today with the Atlas/Centaur system.

What we have found in trying to market this system commercially is—the obvious feedback we get from most of the customers is our price. Because the Ariane system is being marketed worldwide and in the United States very actively, we are under the—we think there is an appearance that that system is being subsidized. It makes it very difficult for us to compete with that kind of a system.

Right behind that is the Japanese, which I think will be here, like the Ariane system is, 10 years from now. Their announcement of the H rocket series and its potentials now, we are getting up into the Atlas/Centaur class and even larger, and I think they will be here and competing with the Europeans with their systems, so we will very definitely see that. It is going to be a very competitive environment from here on out. We do not mind the competition. The only problem we have right now is the price issue.

Senator GORTON. Thank you.

Senator Trible.

Senator TRIBLE. It is very difficult to follow my chairman. His questions are always right on the mark. But let me just add a couple, and then thank you gentlemen for your presence today and your contribution.

The NASA viewpoint appears to be that payloads for commercial ELV's be predominantly and exclusively communications and remote sensing satellites. Now, that seems to square with your mission, Mr. Slayton.

Let me ask you gentlemen, Mr. Rector, Mr. Slayton, if that is indeed your view of market possibilities, or do you believe that ELV's can profitably compete with other kinds of payloads as well?

Mr. RECTOR. Right now, the market is commercial communication satellites. I mean behind it is the remote sensing. What is beyond that is kind of hard to speculate. But right now that is the marketplace and that is expanding. But communication satellites is a broad terminology or categorizing of multiple different types of information systems. I think the part of the marketplace that is going to really expand beyond the voice and the TV systems that they are mainly used for right now—and telephone—is the data systems.

Our company has gone to a data management system, electronic mail system. More and more companies will be going that way, and many of them will have their own satellites to transmit data. Federal Express is going that way. So the data part of it is going to be the expanding part of it. Most people think of commercial communication satellites as just communications, but data management I think is the big future of the expanding marketplace.

Beyond that, it is hard to conceive of anything else. But we have even talked about the possibility of providing commercial ELV's to the Air Force, have had some positive discussions. Where we launch weather satellites for them right now, we also launch weather satellites for NASA, we would be willing to do that on a commercial basis, continue that process.

Most of those systems are scheduled to transition from the ELV's of today, Atlas and Atlas/Centaur, to the shuttle. We are willing to do those on a commercial basis and I expressed that to both the Air Force and the NASA.

Mr. SLAYTON. I cannot add too much to that, except what we are discovering is that by virtue of the fact that we are around and people are aware of it, and we have advertised some capability, some payloads that we never would have thought of are suddenly arriving on the horizon, and some classes that certainly I never thought about, and I know Bill has not thought about.

So we do not know how many more of those may come up one of these days. I am an optimist and I think there is a lot more of that sort of thing out there, and once we have demonstrated a capability, we are going to find a lot of people want to use it.

Senator **TRIBLE**. Mr. Slayton, let me add that as you define your market, if I can be of assistance in encouraging the Wallops Island option, you call on me.

Mr. **SLAYTON**. All right, sir; thank you.

Senator **TRIBLE**. And I can keep a confidence. That sounds like something that might——

Senator **GORTON**. Fortunately we do not have a launch site in Washington.

Senator **TRIBLE**. That's right. I am not in competition with my chairman for that. But we have got the people on the job, and it is an excellent facility, and I would like to see it stay in use.

I have some additional questions, but I think that really the chairman has adequately fleshed out the subject, and I appreciate your leadership as private entrepreneurs, and it seems to me this whole area holds exciting possibilities for this country and for our people in terms of jobs and improvement in the quality of our lives. So let us press ahead, with vigor, as someone once said.

Senator **GORTON**. Thank you both very much.

Our final witness will be the executive director of the American Space Foundation, Mr. Whiting.

Senator **TRIBLE**. Mr. Chairman, Mr. Whiting is an old friend and a Virginian. May I just say a word of welcome as a preface to his testimony?

Senator **GORTON**. You certainly may, and you also will have the first chance to question him.

Senator **TRIBLE**. Well, I will not impose many questions on the committee, but I have known Fred Whiting for a number of years, and I have great respect for him. I would simply like to say at the outset that in a few short years ASF has become, Mr. Chairman, the largest prospace citizens lobby in our country, with more than 22,000 members.

Mr. Whiting, yours is a critical combination of roles—advocate, watchdog, information for the Congress, communicator to the public. You are doing an excellent job, and I look forward to your valuable input. I am glad you are here today to share your thoughts about this particular legislation.

Thank you, Mr. Chairman.

Senator **GORTON**. Mr. Whiting.

STATEMENT OF FRED WHITING, EXECUTIVE DIRECTOR, AMERICAN SPACE FOUNDATION

Mr. **WHITING**. Mr. Chairman, Senator Trible, I am pleased to have this opportunity to testify on behalf of S. 2931, the Commercial Space Launch Act. This bill is a simple, yet essential step toward the commercial development of space. The American Space Foundation, which as the Senator has mentioned, is the Nation's largest prospace citizens lobby with over 22,000 members, applauds the introduction of this necessary legislation and applauds those Members of the Senate and the House, in particular Senator Trible and Congressman Daniel Akaka who authored it and its companion meausure, H.R. 3942, and we strongly urge the passage of this bill.

ASF believes that the enactment of S. 2931 would greatly enhance opportunities for commercial space development which would, in turn, benefit the United States both economically and politically. Economically, it would encourage commercial space investment and thus promote domestic economic activity. Politically, it will help the United States maintain its position as the front runner in the area of commercial space exploration and development.

As members of the subcommittee well know, expendable launch vehicles face numerous obstacles to widespread commercial use. These are not technical obstacles. Technological developments have made them as reliable as humanly possible; nor are there any legal restrictions forbidding ELV launches. Indeed, NASA and the administration have sought to encourage the commercialization of space. Rather, private commercial space launches have been choked by an excess of bureaucratic red tape.

In order to get a private ELV off the launch pad, as members of the subcommittee know, the average firm has had to run a bureaucratic gauntlet of some 18 Federal agencies, overseeing 22 statutes or regulatory guidelines, none of them passed or promulgated with the express intent of overseeing commercial launch vehicles.

One company, in fact, reported spending a quarter of a million dollars in 6 months trying to receive launch clearance for a test flight. S. 2931 would eliminate some, if not most of this unnecessary cost and effort.

Members of the subcommittee are familiar with the provisions of the act, but I would like to suggest that there are several important economic and political reasons for supporting this legislaton. Few would argue, of course, that the nature of ELV's requires Government supervision, but it is also clear that the present amount of red tape hampering the licensing procedure is excessive and undesirable. These hindrances cost the taxpayer, the launch firms, and the Government both time and money. S. 2931 would be, therefore, an economically desirable measure.

With the enactment of this bill, the Government would speed up the process by authorizing a single office to handle private ELV licensing, rather than having different licensing procedures required by a number of individual offices. The government would therefore save money by turning part of the research and development and other general costs involved in space development over to the private sector. Of course, taxpayers would prefer to see the private companies make a profit through market competition and thus stimulate the economy, rather than have the Federal Government spend tax dollars on the same without turning a profit.

Additionally, the space shuttle, as wonderful a vehicle as it is, as we have observed this week, simply cannot handle the increasing market demand for timely and dependable space launches. Private ELV's would therefore complement the work of the shuttle. NASA has been in favor of launch commercialization and is vigorously pursuing strategies for commercial space development, as we all know.

The Federal Government would also have the opportunity to make money on the sale of excess launch equipment. The Congressional Budget Office reports that the costs involved in the licensing procedure may be partially offset by the sale of such equipment. The sale of excess launch equipment and property would be beneficial to the Government for raising revenue. It would benefit the industry by providing inexpensive spare parts and facilities, and it would assist the taxpayer who would be delighted to hear about a spare rocket engine being sold, and not uselessly rusting away in some warehouse.

Clearly, the bill would also save the launch companies time and money. Statutory authority invested in one agency will allow DOT's Office of Commercial Space Transportation to develop the necessary special competence to understand the unique issues involved, and would provide the industry with the certainty and stability necessary to making long-term decisions with confidence.

This one-stop-shopping approach would be more convenient and conducive to commercial endeavors, while still being flexible enough to allow for technical improvements and growth.

From a political standpoint. S. 2931 is a positive step for the United States. The Federal Government's role should be to clear the obstacles of private space launches while maintaining a watchful eye over them. This bill provides the necessary supervision, while encouraging essential growth in the private sector that eventually will lead to commercial prosperity.

Furthermore, the regulations will be more effective under this bill. By assigning responsibility solely to the Department of Transportation, DOT can and will be held directly accountable for the safe, fair, and effective licensing and supervision of commercial launches. When a variety of competing agencies are involved in this process, there is no way to hold anyone directly responsible. So the question is, would S. 2931 then lead to the creation of still another bureaucratic web of overregulation? Not likely, because DOT's Office of Commercial Space Transportation has demonstrated exemplary effectiveness and cooperation with the fledgling ELV industry.

A second political reason for supporting this act is that it will enable the United States to remain competitive in the field of international satellite launching and high technology. Arianespace, a company which as we know is heavily subsidized by the French Government, has achieved a laudatory success rate and is already emerging as a threat to U.S. dominance in the field. This act would release the bonds that have tied down American firms and have hampered them from competing effectively.

As Jenna Dorn, the Director of the Office of Commercial Space Transportation has stated, if the United States is to continue leadership in space, we must permit the private sector economy to advance our overall competitiveness in this area.

Now, this bill would not be an artificial subsidy to private launch companies. Rather, it would allow for natural market economies to come into play. If the marketplace cannot support commercial ELV's, they will terminate on their own, but we should not restrict them with Federal regulations that were enacted before space flight was even considered to be practical.

Finally, the American people will benefit from enactment of this legislation. If companies are encouraged to develop space, domestic economic activity will increase and the health of our economy will improve. By the year 2000 it is estimated that commercial space activities will be worth an estimated $200 billion and will lead to direct or indirect creation of some 10 million jobs. S. 2931 will be a great step toward a prosperous economy, creation of jobs, and the challenge of a new frontier. Simply put, it clears the way for the future.

Mr. Chairman, Senator Trible, I would once again like to thank the subcommittee for allowing me to testify in favor of the Commercial Space Launch Act, and I want to assure you that the American Space Foundation is always available to assist you in working for an affirmative American space program.

Senator GORTON. Thank you, Mr. Whiting.

Senator Trible.

Senator TRIBLE. Mr. Whiting, I thank you for your very strong statement. I also appreciate again the very fine job that your organization is doing in acquainting the American people with the rich potential of space.

Let me just ask one question. And this really is for the record. You note in the last paragraph of your statement that commercial space activities can be worth $200 billion and generate 10 million jobs by the year 2000.

Now, NASA's views are not quite as expansive, but I think we all recognize the rich potential space and want to encourage the economic development in space.

Provide, if you will, for the record the sources on which those projections are made.

Mr. WHITING. Several different sources were used in putting together this testimony, Senator. One of them is Aviation Week and Space Technology which just a few weeks ago, several months now, has put together an excellent issue which devotes itself almost entirely to the issue of commercialization of space. In addition, we have used the resources of Congressman Akaka and Congressman Bob Walker. Congressman Walker in particular has been an ardent proponent of commercialization of space, and has made a number of projections of his own.

So, while I will endeavor to find the specific source for that particular projection, I share your confidence in the future benefits of space.

Senator TRIBLE. Well, I have usually found Congressman Walker's projections quite persuasive, and I am sure I will in this case.

I thank you for being here, and yield to my distinguished chairman.

Senator GORTON. If that projection is correct, are we not likely to have a great deal of foreign competition for a market which is so large?

Mr. WHITING. No question about it, Senator. I think that underscores the need for the purposes served by this bill, to remove the fetters on the private sector and allow American industry to compete with other industries on what we hope will be as equal a basis as possible.

Senator GORTON. What actions, other than the Executive order and this kind of legislation might the Federal Government consider to facilitate the policy of privatizing the ELV?

Mr. WHITING. Well, I am interested in the legislation that you are planning to introduce, Senator. We have addressed ourselves to one bill that has already been introduced by Congressmen Bateman and Akaka, called the Tax Status of Space Act, which would remove some of the tax law restrictions on the commercialization of space. We are supporting that bill enthusiastically.

We are looking at the President's recent directive concerning commercialization of space. We are also eagerly awaiting the results of a study that is being conducted by the National Chamber Foundation, called the space enterprise project, the recommendations of which are going to be made public in the very near future. And as we analyze those, we hope to present some ideas to the Congress for legislation which will enhance the commercialization of space.

Senator GORTON. Thank you very much, Mr. Whiting. We appreciate your support and your enthusiasm. Since you are the final witness, the meeting is adjourned.

[Whereupon, at 11:32 a.m., the hearing was adjourned.]

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